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THEOLOGICAL SEMINARY

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FIFTY FAMOUS FARMERS

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FIFTY FAMOUS FARMERS

BY

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AND

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DEDICATED

TO

ALL LEADERS IN AGRICULTURE

AND COUNTRY LIFE

OF

TO-DAY AND TO-MORROW

37001

PREFACE

Many of the great thinkers and leaders of our nation have frequently said that agriculture is the most constructive occupation of men. The success of any movement, institution, or occupation is largely the result of the interest, enthusiasm, and energy of the men behind it.

We have failed in the past properly to recognize the work of our great leaders in agriculture. Adults as well as children too often get the idea that great men are made rather as the result of wars and other destructive agencies than by the constructive occupations such as is agriculture. It is the opinion of the authors that the emphasis should be changed, and a larger part of the time now given to reading should be devoted to the study of the life work of those who have done so much to build our nation through a more scientific agriculture.

Our purpose in preparing this volume is not only to give the proper recognition to many of the leaders of our nation's greatest industry, but also to teach some of the most important principles involved in the development of modern agriculture.

This book gives in story form the progress we have made in many phases of agriculture. It is intended for use of schools, colleges, and public libraries, and we trust will find a place in the home of all who desire to learn more about the progress of scientific agriculture and the men who have done so much to make America a better and more prosperous nation.

LESTER S. IVINS
A. E. WINSHIP

ACKNOWLEDGMENTS

The authors have included authentic matter only in the life sketches included in this book. In every case members of the family, or business or professional associates, or official government records have been consulted in the preparation of the material.

Experts in the service of the United States Government and the different state governments were consulted in the selection and preparation of the material as well as in the list of names used.

Unusual interest has been shown by leading educators in the work. Many persons have given considerable time and thought in helping to make the material absolutely correct as well as interesting and instructive. We hereby express our appreciation to all who contributed in the preparation of this book and especially to the persons and sources mentioned below in connection with each life history as indicated.

1. Stephen Moulton Babcock to W. S. Smith; to the College of Agriculture, University of Wisconsin; to the Bulletin by H. L. Russell of the same college.
2. Carl G. DeLaval to DeLaval Separator Company; and to G. M. Moulton.
3. John Deere to John Deere Plow Company of Moline, Illinois.
4. John L. McAdam to United States Department of Agriculture, Bureau of Public Roads, by S. H. McElwry, Acting Chief.
8. J. S. Leaming to Ohio Agricultural Experiment Station for bulletin by W. A. Lloyd with photographs.

10. Peter Henderson to The Peter Henderson Seed Company by Alfred Henderson.
11. P. G. Holden to Edgar W. Cooley of the International Harvester Company.
12. Joseph E. Wing to his wife, Mrs. Florence S. Wing; and to his son, A. S. Wing.
13. W. D. Hoard to *Hoard's Dairyman* from notes by Charles L. Hill and others.
14. Will S. Robbins to the Robbins family.
15. A. I. Root to W. P. Root; and to M. T. Pritchard of the A. I. Root Company.
17. James R. Howard to American Farm Bureau Federation by H. R. Kibler, Department of Information.
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19. G. Harold Powell to *The California Citrograph.*
20. Wilmer Atkinson to Arthur H. Jenkins, Editor *Farm Journal.*
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23. Seth Hocket Ellis to Dr. J. T. Ellis, his son; and to Dora Ellis, his daughter.
24. Kenyon L. Butterfield to his father; and to Ralph I. Watts.
25. Seaman Knapp to O. B. Martin, States Relations Service, United States Department of Agriculture; to personal friends; and to official government records.
27. Sir John Bennet Lawes to the official government records of the United States and of England.
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37. William Isaac Chamberlain to his son, Joseph S. Chamberlain; to the *National Stockman and Farmer;* and to the *Ohio Farmer.*
39. Liberty Hyde Bailey to A. R. Mann; and to literature about Cornell.
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45. Jeremiah McLain Rusk to W. S. Smith; to the College of Agriculture, University of Wisconsin; to notes by Milton Danziger in *Farm Boys' and Girls' Leader*, Des Moines; and to E. N. Hopkins, Boys' and Girls' Club Leader.
46. J. Sterling Morton to Lulu Dudley, Department of Horticulture, College of Agriculture, University of Nebraska; to Joy Morton, his son; and to N. C. Abbott, Nebraska City, Nebraska.

47. James Wilson to *Experiment Station Record* of November, 1920; and to notes of Milton Danziger, Boys' and Girls' Club Leader, Des Moines.
48. David Houston to his secretary, Dorothy Beck; and to Floyd C. Shoemaker.
49. E. T. Meredith to E. N. Hopkins; to the *Des Moines Register;* and to *Associated Advertising.*
50. Henry C. Wallace to M. A. Jump; and to the *Des Moines Register.*

Members of the family, friends, and business concerns mentioned in connection with each life sketch in most cases furnished the photographs used. The Agricultural College of the State where the subject of each sketch did his work aided in securing photographs for illustrations. The United States Department of Agriculture also gave advice and aided in collecting photographs for illustrations.

LESTER S. IVINS
A. E. WINSHIP

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FARMER INVENTORS

FIFTY FAMOUS FARMERS

STEPHEN MOULTON BABCOCK

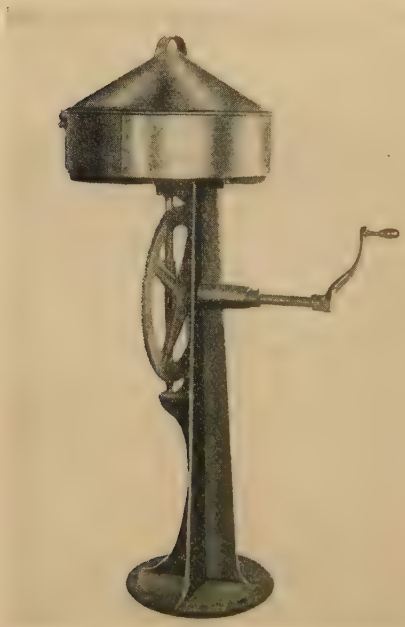
1843-

From the time we are born into the world until we leave it forever, milk occupies a principal place in our diet. The race is dependent for its early growth and consequent development upon milk. Yet there is no other article of diet in which adulteration can take place any more easily: it can be diluted; it can be mixed with other substances. The product thus obtained looks like milk, tastes like milk. The consumer may suspect adulteration, but if he is dependent on his sense of taste alone, he can prove nothing. One can see the far-reaching danger to the race when dilution is practiced so children do not have an adequate amount of the qualities which build bone, flesh, and muscle, and one can see how tremendously valuable an invention would be that would determine the amount of such an important constituent of milk as butter-fat.

Such an apparatus was invented in 1890 by Stephen Moulton Babcock. The announcement of the invention was made in the July *Bulletin* (Number 24) of the Wisconsin Agricultural Experiment Station. So notable was the invention that every dairyman, food-worker, dietitian, or agriculturalist at once thinks of the Babcock Tester when the percentage of butter-fat in milk is mentioned.

Stephen Moulton Babcock's inventions were not the result of genius as the word is popularly understood. They were the result of years of preparation, of years of experi-

mentation. They were the product of that genius which consists of "an infinite capacity for taking pains." Babcock's training for his work started in his preparatory school days at Clinton Liberal Institute. He went from there to Tufts College in Massachusetts, from where he was graduated in 1862. After working ten years, he was able to go to the University of Göttingen in Germany where he studied for three years.



Courtesy University of Wisconsin, College of Agriculture.

The original Babcock Tester used by Dr. Babcock.

Upon his return to America, Mr. Babcock became an instructor at Cornell and in 1882 was called from Cornell to take up work with the New York Experiment Station at Geneva. Here he remained for six years, when Dean W. A. Henry of the University of Wisconsin induced him to come to that institution as Professor of Agricultural Chemistry.

At that time the entire College of Agriculture of the University of Wisconsin was contained in three rooms. Here was worked out in the course of the next two years that apparatus known as the Babcock Tester. Upon its official recognition in 1890 the University opened a dairy school,

Stephen Moulton Babcock

the first of its kind in America. Two instructors were in charge, Dr. Babcock and H. B. Gurler, who was the first practical dairyman to use the test; the enrollment consisted of two students. The success of this school, small though it was, enabled Dean Henry to secure funds from the Wisconsin

Courtesy University of Wisconsin, College of Agriculture.

The first dairy school in America. In this building, during the winter of 1890, the first school for dairy education in America was started.

legislature in 1891 to build Hiram Smith Hall, the first building in America to be constructed for dairy education.

Above and beyond the local benefit to the school, the Babcock Tester contributed a definite service to the world. Up to this time there had been few inventions that were helpful in determining the quality of milk. The earliest practical device was the "viscometer," which is still in use

to measure the viscosity of liquids and to detect adulteration of oils. In 1883 there had been devised the gravimetric method of analyzing milk. This is now the standard milk analysis of the United States. In 1885 there was used a simple method of determining size and number of fat globules in milk, a method that was supplanted in 1890 by the

Courtesy University of Wisconsin, College of Agriculture.

Hiram Smith Hall, the main building shown in this picture, was the first building in America to be constructed for dairy education.

more accurate Babcock test. Following this Mr. Babcock made a number of inventions among which are these:

In 1896, he devised a method to separate casein mechanically from other constituents of milk. He also determined the mathematical formula to calculate, after a simple analysis, the amount of cheese obtained from milk.

In 1896, with H. L. Russell, he discovered the cause

for the diminished consistency of pasteurized milk and devised a method of restoration.

In 1897, with H. L. Russell, Mr. Babcock discovered the digestive ferment in cheese, galactase. This has meant a revision in the method of curing.

Shortly after this, in coöperation with H. L. Russell and J. W. Decker, Mr. Babcock developed the curd test to be used in detecting tainted milk at creameries and cheese factories.

Important as these later discoveries have been, the fame of the Babcock Tester for Butter-fat has overshadowed them all. When the announcement of the discovery of a simple test for fat in milk was made, there was such a demand that over sixty thousand copies of the bulletin, *A Simple Test for Fat in Milk*, were distributed. The congratulations from secretaries of agriculture, from college professors, and from practical dairymen came pouring in. So great was the value of the Babcock test that ten years later, in 1900, Dr. Babcock was awarded the Grand Prize of Honor by the International Jury at Paris, despite the fact that he was not an exhibitor.

On March 27, 1901, a medal was given to Dr. Babcock by the State of Wisconsin, one side bearing the inscription, "In recognition of the great value to the people of this state, and to the whole world of the invention and discoveries of Professor Stephen Moulton Babcock of the University of Wisconsin and his unselfish dedication of these inventions to the public service, the State of Wisconsin presents to Professor Babcock this medal." The reverse side of the medal showed the figures of science and agriculture bringing their offerings to the state.

The governor said in presenting the medal:

"This is indeed a rare occasion. The events that have given rise to it are ennobling and inspiring. Professor Stephen Moulton Babcock, of our University, in the course of his work as a scientist, made a practical invention of untold commercial value, which has revolutionized the dairy industry of the world. A colossal fortune was within his grasp, but putting it aside he sacrificed all pecuniary considerations to his high sense of duty and obligation and gave to the public the priceless product of his great genius and disinterested labor.

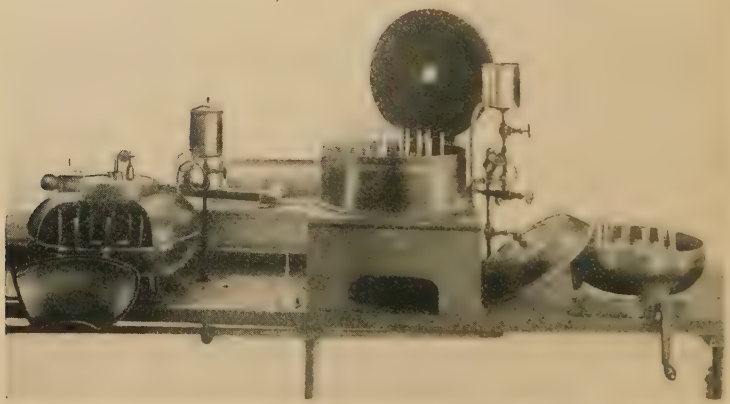
"In the midst of the spirit of commercialism in which we live surrounded by the sordid desire for wealth, its unscrupulous methods of attainment, its idolatrous worship, its unworthy power, such an example of pure-minded honorable conduct, placing a public benefactor high in the confidence of the people, above all taint of suspicion, gives to the dedication of his invention to the public, even greater moral than money value and should make a lasting impression upon the citizenship of the state. The acknowledgment of such an act is uplifting to the body politic, the state. It improves each community, affects each home, and inspires each individual."

All that Dr. Babcock could say was, "I and all that I do belongs to the University of Wisconsin and through it to the people."

The reason for the use of the Babcock test, showing how imperative the need had been, was set forth in an address by C. R. Beach, on February 20, 1889, at the Dairymen's Association, as follows: [1]

[1] *Circular of Information*, No. 32, March, 1912, H. L. Russell.

"Why should I try to produce milk of a high standard to pool with that of poor quality, or to produce cream that has two or three times the money value of my neighbor's, and then sell it at the same price by the gauge? The first step toward improvement among milk producers must be the reorganization of the whole factory system, placing the same



Courtesy University of Wisconsin, College of Agriculture.

A group of modern Babcock Testers.

upon such basis that the patrons shall receive pay for their milk and cream in exact proportion to its true value. . . . This done, it would revolutionize the whole method of keeping cows. . . . I am not prepared to say that the butter-fat in the milk should be the sole and arbitrary standard of its value, but I do say that some more capable standard than we now have must be adopted as there is but poor encouragement for either improving the breeding or improving the feeding."

Many devices were used by Dr. Babcock before he dis-

covered the present plan of testing milk. Finally he found that when the proper quantity of sulphuric acid was used it rendered soluble all solids not fat, while the heat evolved in the mixture melted the fat, allowing it to rise to the surface. This was measured through the agency of a centrifugal machine which caused the fat to gather in the narrow graduated neck of bottles used in this machine. It was found that any careful person could complete the test in five minutes and be able to read the percentage of butter-fat by an inspection of the neck of the graduated bottles. The completed details of how the test is made may be secured from the dairy department of any college of agriculture in any state.

Many objected to the method because the results were expressed in terms of butter-fat instead of butter. Some supply houses attempted to manufacture a larger pipette than that used by Dr. Babcock in order to account for the "overrun." This caused confusion; consequently states began to pass laws fixing standards for the graduation of the test glassware as used by Dr. Babcock. Hence the mode of measuring the milk, the volume of the sampling pipette, the character of the test bottle, and the method of operation of the centrifugal machine remain to-day the same as they came from the hands of Dr. Babcock in 1890. The mechanical make-up of the centrifugal machine has been improved.

H. L. Russell states in the *Circular of Information*, No. 32, "that the method invented by Dr. Babcock has been adopted as a standard method by the Association of Official Agricultural Chemists in the United States and Canada, and the test is used in many other parts of the world in preference to other tests for butter-fat. Furthermore, the

test can well be called The Founder of Modern Dairy Education."

It is now generally conceded that the Babcock test transformed dairying from a haphazard occupation into an attractive, scientific business; that this test has become synonymous with better cows, better milk, and better dairy farming; that it has stimulated better breeding of dairy herds, promoted factory efficiency, and started dairy farmers on the road to a greater prosperity.

Dr. Hunt of the Christ Presbyterian Church of Madison, in commenting upon the service of Dr. Babcock, said, "There is one man in this city whom I envy, a man who might have been rich, might have legally gathered a huge pile of gold, but who chose to remain poor that he might serve his state. This is Professor Babcock. Compare the honor and the love of a great state for this man with the man who has merely lived to pile up riches for himself. The former is rich, and the latter poor indeed."

CARL GUSTAF P. DE LAVAL

1845–1913

Carl Gustaf Patrik De Laval, who ordinarily used the name of Gustaf, came of an ancient French warrior family, a scion of which fought with Gustavus Adolphus in one of that great Swedish general's campaigns and in 1622 settled in Sweden, where he was afterward ennobled. The family continued to devote itself mainly to military service, and Gustaf De Laval's father was a well-known captain in the famous Swedish Dal regiment.

As a child Gustaf showed a strong inclination for mechanics and seized upon every opportunity to take apart and put together again anything mechanical that came to his hands, such as watches, locks, guns, and the like. After he had studied at home until twelve years of age and then attended a preparatory school at Falun, his parents became satisfied that he should pursue a technical career and sent him to the Technological Institute of Upsala University, which he entered in 1863 and from which he was graduated with distinction three years later.

After working in an iron mine and as draughtsman with a water-works building for a time, he discovered one day that his technical knowledge was insufficient to enable him to make a certain mathematical calculation he was called upon to make. He thereupon decided to return to Upsala and continue his studies. He devoted himself especially to chemistry and physics, receiving the degree of Doctor of Philosophy in 1872.

From 1872 to 1877 he was very active in many kinds of scientific investigation and practical engineering work. Sent to Germany to study the manufacture of sulphuric acid, he returned and built the first furnace for the purpose of manufacturing sulphuric acid in Sweden. He engaged for a time in glass manufacture on his own account, a venture which proved a commercial failure. Then he became constructing engineer with an iron works, where he accomplished many improvements in galvanizing in the production of steel and in the extraction of phosphorus from iron ore, besides making many experiments with steam engines and petroleum motors.

It was while making an experiment in sand-blasting that the accidental breaking loose of the steam jet he was using gave him the idea which led to his later invention of the De Laval steam turbine, an invention which is the basis of most of the types of steam turbines now being made and successfully used for motive power purposes in the United States and other countries, including the turbine which bears his own name.

There was a large dairy on the iron works estate where Dr. De Laval was employed as a mechanical engineer, and one evening one of his associates spoke of having just read in a German dairy publication that was taken by the proprietor, of a new invention for skimming milk by rotating it in a barrel, which caused the cream to come to the top more quickly than it would from gravity and enabled its being skimmed off when the barrel came to a stop.

The article explained that the separation was the result of the centrifugal force developed by the revolving of the barrel. There was some discussion of the feasibility of such

Carl Gustaf Patrik De Laval

a thing, and Dr. De Laval was so interested that when he went to bed he took the paper with him. At breakfast the next morning he told his associates that he understood the process and believed he could so improve it as to discharge the cream from the revolving vessel while in motion, so that it would not have to be skimmed off by hand, as in the case of the German device in question.

His employer was so impressed that he offered to buy the invention, but with a fine sense of honor Gustaf De Laval explained that he felt obligated to first offer it to the German engineer whose experiments had led to his conception of the idea, and this he proceeded to do for a very nominal consideration. The German engineer doubted its practicability, however, and after waiting on him for a time Dr. De Laval went ahead with the building of an apparatus and filing of patent applications.

In October, 1877, he exhibited a separator at work to a few interested persons, but the power required was too great and the capacity too small to be of any practical use. By New Year's day, 1878, he had completed a second and better machine for separating cream, and in February of that year entered into the business arrangement which constituted the foundation of the De Laval Separator organization in Europe and that of the American business begun five years later.

Dr. De Laval not only invented and perfected the first continuous cream separator but conceived and perfected in addition practically all the means that have since been utilized for revolving the bowl of the separator, either by hand or by power.

First practical De Laval Cream Separator — introduced in 1878.

First De Laval "Hollow Bowl" hand cream separator — introduced in 1885.

First De Laval "Alpha Disc" hand cream separator — introduced in 1890.

First De Laval "Split Wing" Tubular Shaft hand cream separator — introduced in 1900.

1919 De Laval hand cream separator automatically oiled and possessing all other latest improvements.

His first separator was of the belt-driven power type. A few years later he conceived and patented the first practical type of hand-driven machine, and not only one such machine, but three entirely different types of such construction. One depended upon friction wheels to drive a tubular-shaped bowl horizontally. Another drove the bowl vertically by bevel gear cogs. A third embodied the type of gearing which, with its later improvements, is used in the De Laval hand separator of to-day, and which has been copied by many competitors.

Dr. De Laval also applied his steam turbine idea to the cream separator, perfecting and filing patents for two types of steam turbine driven separators — the "S" shaped flyer and the bucket-rimmed steam wheel — in the same year that he brought out the three types of hand-driven machines. This application of the steam turbine principle to the cream separator was the stepping-stone to the further development of the steam turbine for motive power purposes as now employed in so many different ways.

Nor was Dr. De Laval's dairy work by any means confined to the cream separator. His invention of the so-called lactocrite was the first practical milk tester and led to the development by Dr. Babcock of the simpler tester universally employed in America to-day, and of similar testers in other countries. The milk tester for the first time made possible the easy determination of the butter-fat quality and of the value of milk and has been the basis of as important a revolution in dairying as the cream separator.

Dr. De Laval also invented the centrifugal churn, to churn continuously the cream delivered from the bowl of the separator, and the emulser, designed to emulse with

skim milk some substitute for the butter-fat removed from it, and now used for making various chemical emulsions. He was, in addition to all this, the inventor of one of the first mechanical milkers and is reported to have about perfected an entirely new and different machine of this kind.

He made many inventions in other fields; he perfected a new kind of lamp; spent large sums of money upon a new type of vessel so shaped and propelled as to lessen the water resistance; he constructed a new kind of explosion-proof steam boiler; and sustained great financial losses in the commercially unsuccessful effort on a large scale to extract metals from ores by electrically developed magnetism.

Great as an inventor, broad-minded, unselfish, never thinking of money or the cost of anything he undertook, Dr. De Laval was not a very good business man; and as a rule his large income from the separator and other successful inventions was devoted to further experiments and their sometimes unsuccessful exploitation.

As a man, Gustaf De Laval was respected and loved by all who came in contact with him. Possessed of an intense spirit of patriotism, he was induced to participate in public life for a time, serving first as a member of the Lower House of the Swedish Parliament from 1888 to 1890 and then in the Upper House or Senate from 1890 until 1896, when he declined reëlection. He found that he had no more taste or capacity for politics than for the commercial side of business.

Many honors were bestowed upon him. From the king of Sweden he received the Cross of Commander of the Order of Wasa and that of Knight of the Order of the North

Star. He was made a member of the Academy of Sciences in 1886 and received the Academy's gold medal in 1892. In 1896 he was made an honorary member of the Agricultural Academy. In 1904 the Engineers' Society of Germany unanimously awarded him a medal for his pioneer steam turbine work.

Dr. De Laval conferred many important and lasting benefits upon mankind. The cream separator and the milk tester both conceived by him, though further developed by others, have alone saved billions of dollars to the world's dairy interests and have made possible the wide use of dairy products as we know them to-day; while the steam turbine, in its different forms of utilization, is proving of ever increasing importance; and a half dozen other inventions have all proved their usefulness.

Gustaf De Laval, the man, is dead, but the world's force for good developed by his genius and the power for advancement resulting from it must live through the ages, as long as history lasts.

JOHN DEERE

1804–1886

John Deere, one of the pioneer settlers of Moline, Illinois, ex-king plow manufacturer of the world, and third son of William Rinold and Sarah (Yates) Deere, was born at Rutland, Vermont. His father was a native of England. His mother was born in Connecticut, the daughter of a captain in the British army who came to this country during the Revolutionary War.

In 1805 William Deere removed to Middlebury, Vermont, where John attended the common schools and acquired a good ordinary education. Without the knowledge of his mother, he worked for a tanner at grinding bark, and earned a pair of shoes and a suit of clothes before he was sixteen years of age. When seventeen he apprenticed himself to Captain Benjamin Lawrence of Middlebury to learn the blacksmith's trade, which he fully mastered in four years, receiving in the meantime for his services, each year respectively, the sum of thirty, thirty-five, and forty-five dollars.

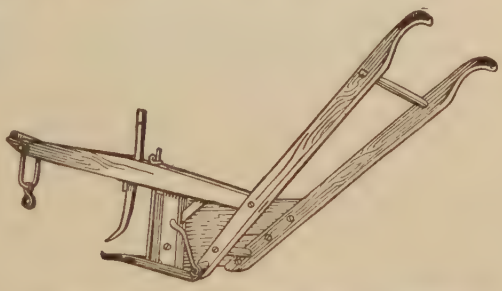
After a year or two at this work he removed to Burlington, Vermont, where he hammered out by hand the iron work for a saw and oil mill erected at the neighboring town of Colchester, and acquired thereby a local reputation as a mechanic and iron-worker.

He was married, with a young family, and profits were small, but by perseverance and economy the year 1837 found him ready to try his fortune in the great West. He

JOHN DEERE

was then thirty-three years old. Passing through the canal and the lakes, he landed at the sickly little village of Chicago, a place opulent in chills and fever but frugal indeed in essential resource. He at once transferred all his effects to wagons and moved on to the village of Grand Detour, Ogle County, Illinois.

An inventory of his material wealth at that time showed him to be the possessor of $73.77 in cash, a good set of blacksmith's tools, and a limited complement of household goods; but he had strength, courage, and a resourceful mind.



The plow Daniel Webster used. It was built almost entirely of wood. This type of plow was not satisfactory to John Deere.

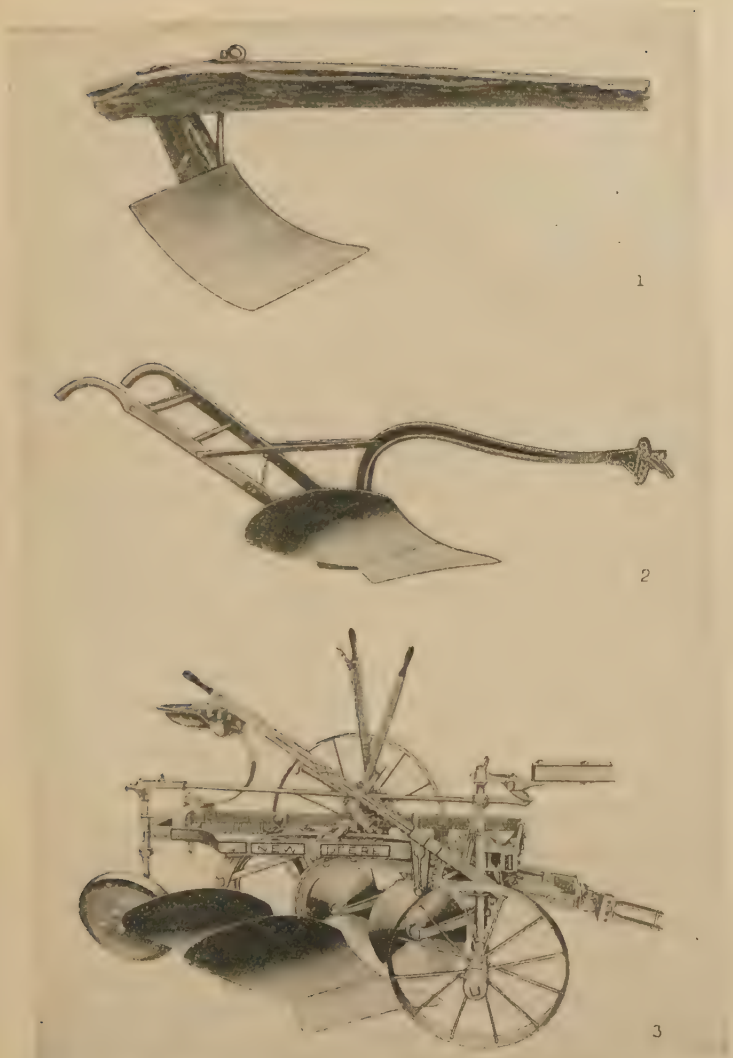
A good mechanic is always an important accession to a new country, and his arrival was particularly opportune for the little settlement of Grand Detour. His mechanical ability was immediately brought into requisition to put into repair a sawmill which was standing idle from the breaking of a Pitman shaft. There was no forge in readiness, but he at once set to work, and with stone from a neighboring hill constructed a rude forge and chimney by digging a hole in clay soil and making the mortar of the clay. Within two days after his arrival he had the mill running, thus saving the owners and customers many days that otherwise would have been occupied in procuring the work from far distant shops.

His skill becoming known to the few people residing in the vicinity, they piled upon the floor of his shop their broken trace chains and clevises, their worn-out "bull tongues," and worse worn shares. While the young blacksmith hammered out lap rings for their chains, welded their clevises, "drew out" their "bull tongues," and laid their "shares," his mind dwelt upon the improvement of the plow, the implement of greatest importance to the pioneer.

He soon added the building of plows to his general work. He began to see, however, that the iron plow with wooden moldboard could not be made to do good service in the prairie soil. It entered the ground with difficulty, clogged up, and failed to scour. Then began the series of experiments and improvements which finally resulted in the present perfect steel plow, for which he has become widely famed.

The first plow that did satisfactory work was made in this way: wrought iron landside, standard steel share and moldboard cut from a saw mill saw and bent over a log shaped for the purpose, and beam and handles of white oak rails. In 1838 three of these plows were made. They did unusually good work for those days, and the farmers were well pleased.

After these first plows, Mr. Deere had a great deal of trouble experimenting in getting a plow to scour satisfactorily in ground that had been plowed four or five times, especially on the black, sticky, bottom soil. To try his plows he went to different farms in Ogle, Lee, Whiteside, and other counties, where farmers had never been able to make plows scour.



1. John Deere's plow. Remains of first steel plow made by John Deere in 1837. This first plow marked a new era in plow construction and agricultural development.

2. A walking plow which shows the second step in plow construction.

3. The gang plow invented in 1873 marked the third step in plow construction. This plow has two bottoms.

In 1838 John Deere built a dwelling house, eighteen by twenty-four feet, and brought his wife and five children from the East. It was then a weary journey of six weeks by stage coach and lumber wagon.

Settled in his little home, though often shaking with the ague, he pushed forward his work. In 1839 ten plows were built, and the entire iron works of a new saw and flouring mill were made, with no help except that of an inexperienced man as blower and striker. The next year a second anvil was placed in the shop, a workman employed, and forty plows made.

John Deere's fame as a plow maker was now rapidly extending, and in 1841 he made seventy-five steel mold-board plows and built a brick shop thirty by forty-five feet. The year following one hundred new plows were added. The tide which was then set clearly in his favor, afterwards bore him steadily on to fortune. In 1843 he took Major Andrus into partnership, enlarged his buildings by erecting a two-story brick shop, added horsepower for the grindstone, established a small foundry, and turned out four hundred improved plows.

In 1846 the annual product had increased to one thousand, and, as time advanced, improvements were made, but the difficulty of obtaining steel of proper dimensions and quality was found to be a great obstacle to the complete success of the business. Mr. Deere accordingly wrote to Nailor & Company, importers, of New York, explaining the demand of the growing agricultural states of the West for a good cast-steel plow and stating the size, thickness, and quality of the steel plates he wanted. The reply was that no such steel could be had in America, but that they would

send to England and have rollers made for the purpose of producing the special sizes of steel. An order was sent, and the steel made and shipped to Illinois.

During the same year, with the view of developing a market nearer home where he could obtain material for his plows, Mr. Deere opened negotiations in Pittsburgh for the manufacture of plow steel, as is shown by the following extract from James Swank's book, *Iron in All Ages:*

"The first slab of cast plow steel ever rolled in the United States was rolled by William Woods at the steel works of Jones & Quiggs in 1846 and shipped to John Deere, Moline, Illinois, under whose direction it was made."

It was in the shaping of the moldboard that Mr. Deere's ingenuity more particularly manifested itself. He was undoubtedly the first man to conceive and put in operation the idea that the successful self-scouring of a steel moldboard depended preëminently upon its shape. The idea was his, and he worked upon it until its correctness was fully demonstrated.

John Deere's practical foresight enabled him to see that his location was not advantageous for a growing business. Coal, iron, and steel must be hauled from La Salle, a distance of forty miles, and his plows must be taken a long distance to market in the same slow and expensive manner. He therefore sold his interest in the business at Grand Detour to his partner, Mr. Andrus, and removed to Moline, Illinois, where there was good water power, coal in abundance, and cheap river transportation.

A partnership was formed between John Deere, R. N. Tate, and John M. Gould, shops built, and work commenced, resulting the first year in the production of seven hundred plows.

4

5

6

4. The light tractor plow represents the next stage in development after the gang plow. This plow has three bottoms.

5. This is the fifth stage in the development of the plow. It should also be understood that plows of this style, only larger, are now being built with ten, twelve and fourteen bottoms when they are pulled by engines.

6. Tractors are used in many parts of the world to pull plows with two, three, and more bottoms.

About this time the English steel arrived, and fifty plows were made from it and sent to different parts of the country where the soil was known to be the most difficult for plowing. The test proved the success of the implement and in 1850 the manufacture sprang at once to the enormous number of one thousand six hundred plows a year.

In 1852 Messrs. Tate and Gould retired from the firm, Mr. Deere buying their interests. The next year the shops were enlarged, new machinery added, and the sales continued to increase. Mr. Deere continued alone until 1857, in which year he made ten thousand plows. Then he took his son, Charles Q. Deere, and one of his sons-in-law, Stephen H. Velie, into the business as partners, and the business continued under the name of Deere & Company until 1868, when it had assumed such proportions that a company was incorporated under the general laws of the state. John Deere was president until his death, Charles Q. Deere being vice president and manager, and Stephen H. Velie, secretary. The business has had a steady and marvelous growth, requiring the annual addition of shop-rooms, men, and machinery.

John Deere was the architect of his own fortune. His great wealth was acquired by his individual effort and industry. He is identified with the interests of Moline, the silent and unwritten history of whose streets, railroads, and public institutions are replete with his spirit and untiring energy.

It is conceded that John Deere is the originator of the steel plow. When he manufactured his first steel plows, there were not only no steel plows, but no steel manufactured of which to make them in America. The influence of this

improvement in the manufacture of plows can not be estimated. The name of John Deere is a familiar one throughout the West, and his plows are in world-wide use. They have been awarded medals at numerous county, state, and national exhibitions in this country, and they have received the highest award at many world's expositions.

Mr. Deere was twice married. In 1827 at Granville, Vermont, he married Miss Damaris Lamb, who became the mother of eight children. She died in 1865, and he later married her younger sister.

He was elected mayor of the city of Moline and served two years. He was also president of the First National Bank of Moline, and a director to the day of his death. He contributed toward the founding of the public library of which he was a director for many years.

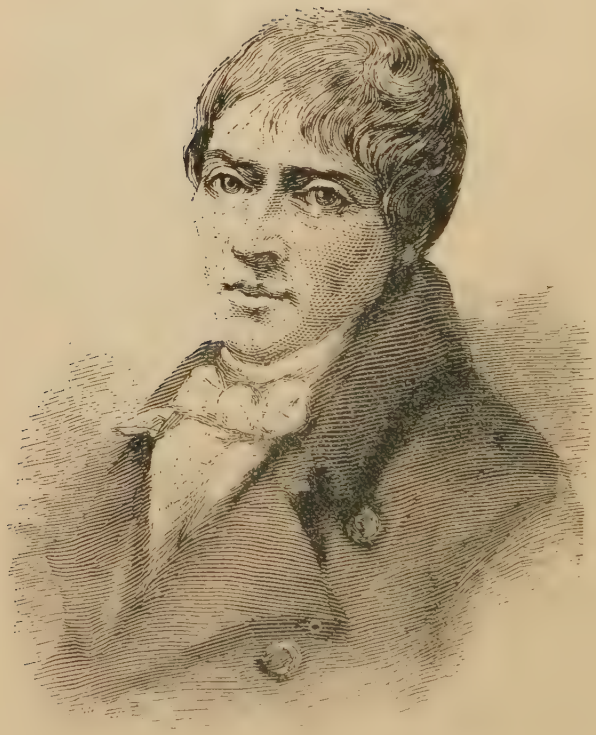
In personal appearance John Deere was large and well proportioned and had great physical endurance. In his younger days he would stand at his anvil from five o'clock in the morning until nine o'clock at night, building plows, shoeing horses, and constructing machinery for sawmills. Absorbed in business, he had neither the desire nor time for the public offices which sought his services. He was, however, always in sympathy with public interests, and gave liberally of his means to advance them. He was an active member of the Congregational Church and a generous contributor to local and foreign objects of benevolence. The religious, moral, and educational interests of society had in him a friend and patron, and few men were more entertaining in the social circle. He died in his eighty-third year.

JOHN LOUDON McADAM

1756–1836

John Loudon McAdam was a famous highway engineer of Scotland who originated the method of constructing roads which was named after him. He was born at Ayr, Scotland, but passed his youth in New York. Mr. McAdam returned from New York to Scotland in 1783, and from then until 1798 he served as a Trustee of the Roads and Deputy Road Lieutenant of Ayrshire. In 1798 he removed to England and in 1815 was appointed to the Superintendency of the Roads of the Bristol District. Between 1798 and 1815 he is said to have traveled thirty thousand miles and spent more than five years and £5000 in investigating the roads of Great Britain. In 1811 he made a communication to a Committee of the House of Commons on the subject, containing outlines of his system and directions for repairing roads. In 1827 he was appointed General Surveyor of the Metropolitan roads and, in reward for his exertions to render them efficient, received a grant of £10,000 from the government.

John McAdam's interest in road construction was aroused while serving as Road Trustee in Ayrshire. After much experimentation, largely at his own expense, he reached the conclusion that broken stones, when applied in a specified manner, supplied the best material for road construction. His theory of road building was "that the natural soil really supports the traffic and that while it is



Courtesy U. S. Dept. of Agriculture.

JOHN L. MCADAM

preserved in a dry state it will sustain any weight without sinking." The two essential requisites, therefore, were drainage and a waterproof cover. The old method, which had obtained previous to this time, consisted of digging a trench into which the hard material was placed. Mr. McAdam pointed out that this trench formed a veritable reservoir in which water accumulated, softening the foundation in rainy seasons and freezing and upheaving in the winter. He advocated raising the road above the surface level in order that water might drain off. He demonstrated the fact that small angular fragments of broken stone, when properly spread on the roadbed and subjected to the impact of traffic, consolidate, forming a hard crust, impervious to water.

Mr. McAdam disproved the theory that a soft foundation would not sustain a road. In his *Remarks*, published in 1823, he says, "It is a known fact that a road lasts much longer over a morass than when made over rock. The evidence produced before the Committee of the House of Commons showed the comparison on the road between Bristol and Bridgewater to be as five to seven in favor of the wearing on the morass where the road is laid on the naked surface of the soil, against a part of the same road made over rocky ground." Roads constructed after the method of John McAdam are known as macadam roads when the material consists of broken stone. The same principles, however, govern the construction of all roads having a foundation of native soil and a surface of hard material.

His system rapidly became general throughout England, and was also introduced into France with great success. In 1816, Mr. McAdam commenced carrying his system of

road building into operation and in a few years out of the 25,600 miles of public roads in the Kingdom nearly seven tenths were macadamized; at his death, it is believed that there were less than two hundred and fifty miles of the whole not macadamized.

John Loudon McAdam died at Moffat, in Dumfrieshire, November 26, 1836. His work became famous, and his two books, *A Practical Essay on the Scientific Repair and Preservation of Roads* (1819), and *The Present State of Road Making* (1820), were widely read.

ELI WHITNEY

1765–1825

When the Constitution of the United States was adopted, the country produced only one pound in every two hundred and forty pounds of cotton raised throughout the world. Fifty years later we produced seven of every eight pounds. This remarkable increase is unparalleled and is largely due to one invention, that of the Cotton Gin.

Eli Whitney, the inventor of the cotton gin, was born in Westboro, Massachusetts. As a lad he worked in a blacksmith's shop making nails by hand. He was skilful and earned more than a man's wages. He was also thrifty, saved his money, and at twenty-three was able to enter Yale University from which he graduated four years later.

The only line of activity for a young man who had spent all his money getting an education was to teach. Young Whitney secured a position in a private family in Georgia as a tutor to their children. After making the long journey, he found that they had hired another tutor. It was disheartening, after he had made every sacrifice to obtain a college education, for Eli Whitney to be stranded one thousand miles from home, with no friends, and with no money to return. This adversity, however, led to great achievement.

Mrs. Nathaniel Greene, the widow of a famous general in the Revolutionary War, offered Mr. Whitney a home on

her beautiful plantation near Savannah. It happened just at that time that the farmers in Georgia were troubled because it did not pay to raise cotton, the crop which grew better than anything else on their land. The principal reason was that it took too much labor to get the seeds out of the cotton boll for what it paid. It took a colored woman a full day to pick the seeds from one pound of cotton. Unless a more rapid method could be found to remove the seeds from the cotton, there was no way to make cotton raising profitable.

While Eli Whitney was living at Mrs. Greene's, she attended a meeting of the planters called to discuss the situation. When some one declared that seeding of cotton should be done by machinery, Mrs. Greene said, "There is a very handy young man at my house. I would like to have him try to make such a machine." Her remark opened the way for Eli Whitney's invention which brought prosperity to the entire South.

Mr. Whitney had never seen any cotton bolls, but he had made more nails on the anvil in a day than any one else in Westboro. He had also a good college training. Moreover, he set about a study of the problem as no one else had ever done. He examined the cotton plant carefully to see what made it so difficult to separate the seeds from the cotton boll. He did nothing about constructing the machine until he knew everything that could be learned about the condition of the plant, the boll, and the seed. Then he tried to solve his problem. He made his own tools, drew his own plans for a machine, and then began working on its construction. The task took him all winter, but by spring he had solved it.

Eli Whitney

The news that the machine was finished spread rapidly. Mr. Whitney let Mrs. Greene see it first and then let her bring a man to inspect it. So exasperated were some of the people who had been interested that the invention was not immediately given over to them that some of them broke into the house at night, stole the machine, the model, plans and all. They then began to manufacture and sell machines based upon the plans. Because of this, Eli Whitney had much trouble in securing a patent and was thus robbed of any profit that should have been his. Some states, however, were appreciative of his service to the South. South Carolina paid him fifty thousand dollars for what he had done for the planters. North Carolina paid him a good royalty on all the machines used in that state. Texas voted him a large sum, but because of turbulent politics it was never paid. It is interesting to know in this connection how the name originated. At that time a popular word for engine was the abbreviated form "gin," so that the people of the day called it the "Cotton Gin."

After five years, Eli Whitney, then thirty-three years of age, realizing that he had a genius for invention, returned to the North and turned his attention to other inventions. Among the most important of these later projects was the making of the modern rifle. For more than one hundred years all firearms have been made on the basis of his invention. He established a factory at Whitneyville, Connecticut, and died a wealthy man.

It is hard to estimate the great amount of benefit that the world has gained from Eli Whitney's inventions. Certainly the cotton gin has been one of the greatest benefits to the South. Macaulay, the great English historian, said

that Eli Whitney's invention of the cotton gin had done more than any other one thing toward making the United States a world power in progress. Robert Fulton, the man who made the first practical steam vessel, said that the three men of the time who had done most for mankind were: Arkwright, who invented the textile machinery which made factory production possible; Watts, who made the steam engine possible; and Whitney, who made the cotton gin, which could in a few days seed as much cotton as one hundred men could do in a month, and which laid the foundation for the modern cotton mill.

Courtesy International Harvester Company.

CYRUS H. MCCORMICK

CYRUS H. McCORMICK

1809–1884

The name of Cyrus H. McCormick is ever associated with what is now known as the McCormick Reaper. This machine, a combination reaper, harvester, and binder, was the project of the inventive genius of Cyrus H. McCormick and a collaborator, Marquis L. Gorham.

Courtesy International Harvester Company.

Using cradle. Mr. McCormick was determined to improve the cradle method.

When one reads of the number of things that Mr. McCormick, then a young man of twenty-two, had to invent in order to have even a crude machine that would really cut wheat, one can appreciate what it meant to invent the Reaper. He had to have a machine which would separate the wheat which was to be cut from that

which was to be left standing. This necessitated a *curved arm* at the end of the reaper blade. The blade must cut the tangled wheat as well as that which stands up. This required a knife with two motions, one which should cut

Courtesy International Harvester Company.

McCormick reaper of 1831.

forward, and one sidewise. For this he invented what has been known ever since as the *reciprocating blade*. There had to be a row of *indentations* projecting a few inches from the edge of the knife to catch the stalks and hold them upright to be cut. There had also to be a *revolving reel* to lift the fallen stalks. There had to be a *platform* to catch the grain after it was cut. There had to be one *wheel*

which would bear the weight of the machine and move the knife and the revolving reel at the same time. Furthermore, the machine had to be arranged so that its *shafts* would be on one side.

Courtesy International Harvester Company.

McCormick wire binder. Wire was used to bind the grain before the twine-binding apparatus was invented.

All these things Mr. McCormick thought out and put together. He knew that there were literally tens of thousands of farmers who needed such a machine. There had been many men who had tried to make something of the kind. It is curious that the one person who thought it out and put it together was a young man in his native foothills of Virignia. On a hot July day in 1831 one machine for

the first time cut six acres of oats in one afternoon. Mr. McCormick had to wait a year before he tried it again. There was no level wheat field nearer than Lexington, Virginia, eighteen miles away. The second year he went

Courtesy International Harvester Company.

McCormick-Deering 15–30 tractor pulling a McCormick-Deering ten-foot power drive binder with shocker.

there and reaped six acres of wheat to prove the worth of his machine.

After the machine was once put together, the difficulty was to bring it before the public. Mr. McCormick advertised in the *Lexington Union* that he would sell the machine for fifty dollars, but it was seven long years before a sale was made. He took out a United States patent in 1834,

but there was no sale for the machine, and he turned his attention to making iron from the ore in the mountains. This was a good business until the great financial panic in 1837 when he failed, and his creditors took everything he had except his patent and his one machine which had seemed unsaleable.

Courtesy International Harvester Company.

McCormick-Deering 15-30 tractor pulling two McCormick binders with shockers.

In 1840 a stranger rode up to his shop and bought this first machine, paying him fifty dollars for it. Mr. McCormick did not sell another until 1842 when he sold seven at one hundred dollars apiece; in 1843 he sold twenty-nine; in 1844 he sold fifty. By this time his machine began to be known throughout the neighboring counties. His slogan was "Will cut one hundred and seventy-five acres in eight hours."

In 1845 the business was picking up so well that he was able to get $1333 for the reaper agency for eight counties in Virginia and $2500 for the agency of Southern Virginia. In 1847 the business had expanded so much that he had to transfer the manufacture of his reapers to Chicago in order to place his machine before the farmers of the Middle West. For three years he had made his machines in Rockridge County, Virginia; he had to haul them nearly twenty miles to Lynchburg; transfer them by boat to Norfolk; and thence to Cincinnati. This meant a tremendous cost to get them to Chicago where the great market was. After the moving of the business to Chicago, in the first year (1848) Mr. McCormick sold five hundred reapers and the foundation was laid for the enormous business of the International Harvester Company.

It is an interesting fact that the McCormick Reaper was invented and manufactured just a few miles from Charlottesville, Virginia, the home of Thomas Jefferson, who was known throughout his lifetime as the great friend of the farmer, and who had himself invented a plow and encouraged the manufacture of farm machinery.

CREATORS OF BETTER PLANTS AND ANIMALS

LUTHER BURBANK

1849–

In these days of improvement of plants and flowers one must indeed be great to stand far above his fellows in the ability to create new forms and to improve old ones. Luther Burbank, a pioneer in the field of plant improvement, has been preëminent for many years because of his constant additions to valuable plants. Not only has he improved plants that were known to be useful, but he has made valuable many plants that were supposed to be worthless if not dangerous weeds.

Luther Burbank was born on a farm in Lancaster, Massachusetts. From an early age he was proud of the farm and its products; he delighted in knowing that his father produced the best rhubarb, asparagus, celery, sage, onions, peas, beans, and corn in their section. He soon tried making a few experiments for himself. A story is related that he used to trace names and pictures on young pumpkins to see how large the drawings would grow. After having been to a circus, he would trace pictures of the animals he had seen. When the pumpkins were grown, people came from far and near to see Luther's pumpkin menagerie.

It is interesting to see how some of the principles that made Burbank, the man, famous were discovered by Luther, the boy. Before Mr. Burbank created any plant, he learned how to protect it against cross fertilization with a less val-

uable plant. After protection was secured, then one could create. When still a lad, he attracted the attention of his farm neighbors by insisting that pumpkins must not grow near watermelons and muskmelons, because the pollen of pumpkin blossoms spoils the melons by making them somewhat like pumpkins.

Much as Luther Burbank enjoyed the reputation of his father's farm, he had no intention of devoting his life to farming. Considering the long hours on a farm, the length of time that elapses between planting and harvest, and the slight rewards, it is not surprising that he decided to go to the city to get a job. He went into the plow shops in the city of Worcester and looked forward to being a mechanic. It is fortunate for the world that an interest was aroused when he was twenty-two which led him away from the plow shops to experimental farming.

Under certain unusual conditions the potato develops a seed ball with structure very like a tomato. This potato ball attracted Burbank's attention. He decided to plant the seeds from this ball to see what would happen.

There are a number of interesting stories told about his waiting for the ball to ripen so that he could get the seed. A dog rushing through the garden brushed the ball from the vine. Another vine farther on caught it off, but it was several days before the worried would-be experimenter found it. Whether the story is true or not, it is probable that if Mr. Burbank had not planted those seeds, there would be no Burbank potato, and he might still be making plows in Worcester. He planted twenty-six hills of potatoes. When he dug his potatoes, only one hill was especially attractive, hill "Number Fifteen." The potatoes were unusually large,

LUTHER BURBANK

uniform in size, and of a purer white color than any potatoes he had ever seen. The potatoes in "Number Fifteen" weighed one and one-fourth pounds and, when exhibited at the Worcester County Fair, received a premium. In addition to this recognition, one of the prominent seedmen of the country, who lectured at the Fair that year, was so impressed with the potatoes in "Number Fifteen" that he wished to buy the right to raise and sell them as "the Burbank potato," if the young man could make them "breed true." Three years later (in 1875) Luther Burbank sold him "the Burbank potato" for one hundred and fifty dollars.

The potatoes have an especially good color; they are healthier than many other varieties and are said to withstand blight and other diseases. They are smooth and uniform in size, — a convenient size for the table. This is particularly desirable, for hotels and restaurants pay extra prices for potatoes of uniform size.

The Burbank potato has already produced more than twenty million dollars' worth of food, and its yield is greater every year. In that original potato ball there were twenty-six tiny seeds, so small that it would take ten of them to be as large as a pin head. Their ultimate yield of food is beyond the reach of our imagination.

In 1875 Mr. Burbank left Lancaster and journeyed across the continent to Santa Rosa, the community with which he is identified. At first his estate at Santa Rosa was just a nursery for raising trees, shrubs, flowering plants, and vines to sell. Now he has a large house with eight acres of garden, and, eight miles away at Sebastopol, are located the Gold Ridge proving-grounds of sixteen acres.

The most wonderful fact about his creations is that apparently Mr. Burbank can make plants do anything he sets out to have done. Take, for example, his experiments with the old-fashioned gladiolus. He made its stem strong enough to stand alone and made the blossoms so thick as to cover the stalk entirely. He made gladiolus blossoms of every color of the rainbow. And he raised more than a million gladiolus plants to get what he wanted. Now he has many wonderful varieties, such as The California, The Santa Rose, and The Mariposa Gladiolus.

"A weed is but an unloved plant," says Luther Burbank, and literally he loves weeds because he knows that if sufficiently loved they may be used to make better plants. The huechera, now one of the most beautiful and high priced foliage plants, was a good-for-nothing "wildling" when Burbank began to love it in deed as well as in sentiment.

Roses were always beautiful and it did not seem as though there were any occasion to make them more beautiful, but Mr. Burbank early began to heighten the beauty of roses, and perhaps no other variety of plants has gained more in cash value from the new creations than have roses. They are more easily created than most plants. The world-famous Shasta Rose was created in three generations. The Burbank Rose, the freest bloomer in the world, which received the gold medal at the World's Fair in St. Louis in 1904, was created in three generations.

Luther Burbank not only makes flowers more beautiful, but he makes odorless flowers delightfully fragrant. The bee would never suck nectar from a dahlia until Mr. Burbank made it fragrant; then the bees revelled in its nectar.

The verbena, like the dahlia, was neglected by the bees, but he made it fragrant like the trailing arbutus (May-flower). He has also made the cola so fragrant that he has christened his new cola creation "Fragrance."

Probably no other of Burbank's creations has enriched more gardeners the world over than the New Giant Crimson Winter Rhubarb, and probably no other plant received the attention of Burbank for so many years. It was most defiant, and he wanted to reform it in more ways than any other plant, and after eight years he was victorious.

It required eight years of research combined with an infinite patience to develop the Shasta Daisy. Mr. Burbank raised a hundred thousand daisy plants in order to get the daisy he had set out to create. One of the chief characteristics of all daisies has been the mischievous spreading of multitudes of seeds. In two or three years a few daisies would ruin a hay field. No wonder the vexed farmers spoke disparagingly of the daisy as the "whiteweed"! Mr. Burbank took the viciousness out of the daisy. It no longer spreads its seeds and has developed, under Mr. Burbank's care, three varieties, the Alaska Shasta, the California Shasta, and the Westralia Shasta.

Some of his most spectacular successes have been achieved with the plum. Twelve years of experimentation resulted in the pitless prune. Another wonder was the growing of five hundred kinds of plums on one tree at the same time. When he was endeavoring to create the plum he wanted, he had at one time three hundred thousand different blossoms in his garden. The product of this labor was the famous variety called "Chinese."

One of Mr. Burbank's hybrids is the plumcot. This was achieved by cross-fertilizing the plum seed and the apricot seed. Ten thousand plumcots were created before four satisfactory varieties were secured.

"An unloved plant" is only one of Luther Burbank's definitions of a weed. He also calls it "a plant out of place." Again he says, "Weeds are weeds because they are jostled, crowded, cropped, trampled upon, . . . tormented by insects, . . . or lacking in nourishing food and sunshine." With this idea in mind Mr. Burbank made from the little beech weed plums that are especially hardy and not susceptible to the terrors of a cold climate.

He has developed many varieties of cherries which meet every conceivable need of the market, satisfy the desires of cherry growers, and are hardy enough to withstand the enemies of the fruit.

The achievement that has brought Luther Burbank the most glory is the elimination of thorns from brambles and prickly plants whose briers and spines are most troublesome. One of the best-known of his experiments in this line is what he has been able to do with the cactus. For many years the cactus has been regarded as practically useless. It is, however, the only plant that will grow in many desert regions and is, consequently, the only possible vegetation available to animals there. It has in its natural state short, sharp thorns at right angles to its broad, flat surface, and bundles of tiny needles — more than a thousand at the foot of each stem — to act as a protection against animals. When animals ate of these needles, they were sometimes fatally poisoned. Mr. Burbank has eliminated both the short, sharp spines and the bundles of needles. The cactus can

now be used by the desert man or animal as food and drink, for its flesh is edible and it contains a liquid which has been the means many times of saving a lost desert wanderer.

One can see why Mr. Burbank's success with the cactus has been notable, both because of the value he has given to it, and because this achievement is truly indicative of his patience and skill. The problem of cross-fertilization was extremely difficult. One variety that possessed the qualities necessary to propagate is in flower only two and a half hours in the hottest part of the day. Sixteen years of continual experiments were necessary before success was won. But so important was that success that governments awaited it with interest. The value of a cactus that will furnish rich, green food the year around, that will grow on worthless land and need little cultivation, which is capable of producing ninety tons of food material to the acre, can hardly be overestimated. One can but admire the genius and the patience of the man so clearly a benefactor to mankind.

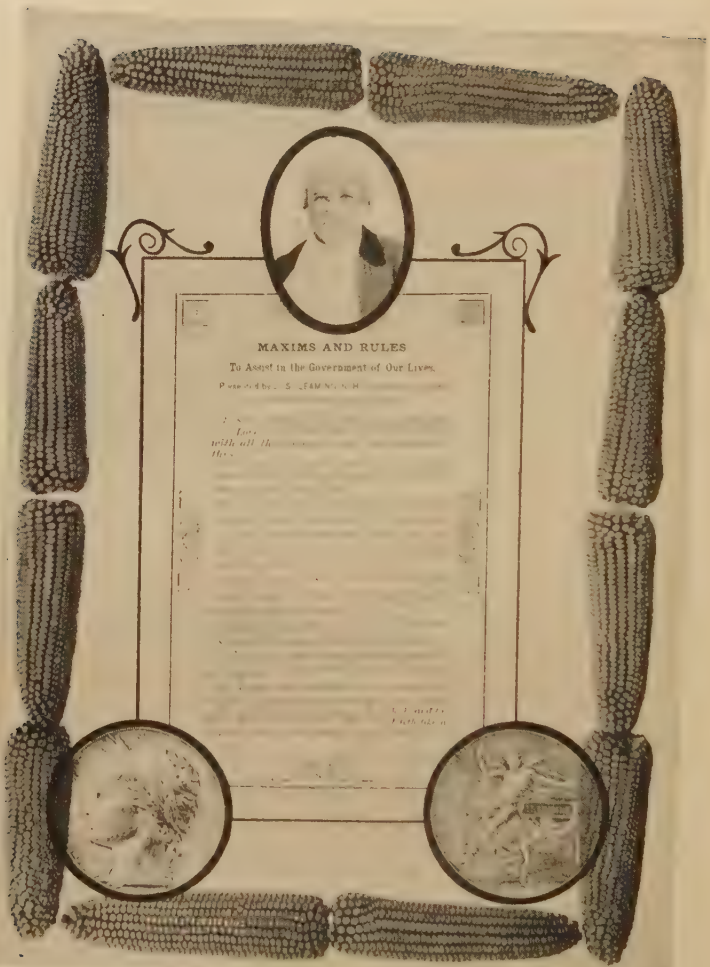
JACOB SPICER LEAMING

1815–1885

Jacob Spicer Leaming was born near Madisonville, now a suburb of Cincinnati, in Hamilton County, Ohio. He was the son of Christopher and Margaret Leaming, who came to Ohio from New Jersey, where Jacob's grandfather, Christopher Leaming, had served for twenty years as member of the Provincial Assembly. Jacob's great-grandfather, Christopher Leaming, came from England to Boston in 1670, and later the family moved to Long Island and then to New Jersey, from where Jacob's father migrated to Ohio. He was much more than an average farmer, and as early as 1825 young Jacob, a lad of only ten years, was acquiring inspiration for his future work through the medium of a hoe handle in the Langdon bottoms along the Little Miami River in Hamilton County, Ohio.

On March 1, 1839, Jacob Leaming married Lydie Ann Van Middlesworth. They had seven sons and two daughters.

During his early married life Mr. Leaming continued to reside near the old homestead and saw much of the land that is now Cincinnati cleared of the forest and converted into corn fields. The corn at this time was of a very nondescript character. Little attempt at improvement had been made. Corn breeding was unheard of. The fertile soil, freshly cleared from the forest, was full of humus and moisture and rich in the elements of plant food. The most



JACOB SPICER LEAMING

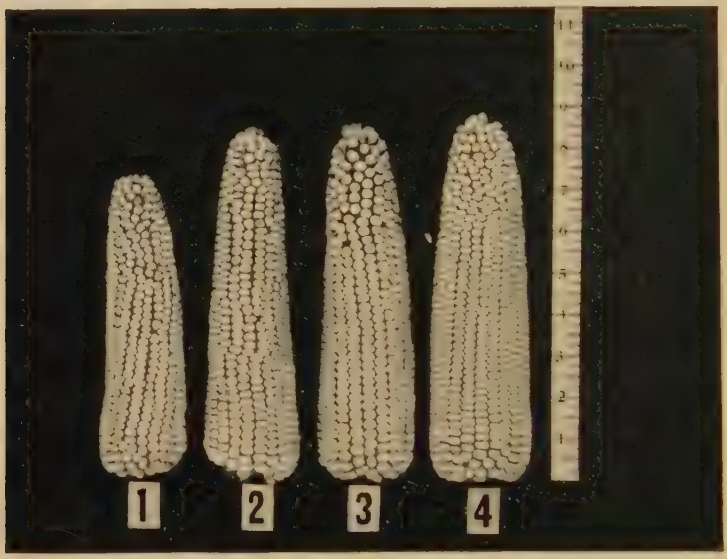
careless methods of planting and cultivation gave fairly satisfactory yields.

One autumn day in 1855, Mr. Leaming was driving in his wagon along Bullskin Run in Hamilton County and, having neglected to bring feed with him for his horses, stopped at a wayside corn field and asked the men husking in the field to sell him sufficient corn for this purpose. He was so impressed with the beautiful yellow color of the grain and also with the maturity, as indicated by its sound, hard condition, that, when leaving, he took with him a bushel of this corn for seed.

In the following year he moved with his family to Clinton County, where he bought a farm about two miles from Wilmington, and here he lived and worked until 1884.

It is the work that he did during the nearly thirty years (1856-1880) he lived on this farm that furnished the world with much valuable information upon producing good corn. When he came to Clinton County, he brought with him the corn that he had bought the previous autumn, and it was first planted by him in the spring of 1856. Mr. Leaming was a good farmer and with his new seed he resolved to raise the largest crop possible. The season was favorable, and he gave the corn the most careful, painstaking attention, reaping his reward in a yield of more than one hundred bushels per acre. This was phenomenal at that time, and the fame of it brought many of the neighbors to inspect the field and get better acquainted with the newcomer who was doing such extraordinary things. Not a few of them carried away sacks of corn to be used as seed. This was planted the following spring and was referred to locally as "Leaming's corn."

In 1857 Mr. Leaming visited the old home in Hamilton County and told his friends there of his success in his new home. In conversation with Dr. John A. Warder of North Bend, a country physician, who even in that early day was advocating better and more scientific methods in farming,



1. Original type 1856.
2. The old Leaming type at the time of Mr. Leaming's death in 1885.
3. The type now grown on the old Leaming farm by P. D. Leaming.
4. "Improved Leaming" from the farm of J. S. Leaming, Jr.

he asked advice as to what the doctor considered the best line of farming to take up. Influenced, we may easily believe, by Mr. Leaming's enthusiasm for his new corn, Dr. Warder advised him to give particular attention to the growth of this crop. Mr. Leaming was thereupon determined to make his first year's extraordinary yield the common one on his farm.

In studying the methods pursued by Mr. Leaming, it is well to recognize the fact that they were original, for he did not have experts from colleges and experiment stations to consult. His work was an evolution. As he grew older, he developed pronounced ideas on the cultivation of corn, and he contributed a few articles on the subject to the *Cincinnati Enquirer* and to the old *Commercial Gazette*.

It was the extraordinary yield in the first year that was chiefly instrumental in popularizing Leaming corn locally. This was the result of careful, thorough, intelligent cultivation. His work with corn was before the day of modern tillage implements. The hand hoe and seven sturdy sons constituted the principal part of his corn tillage equipment; but he began stirring the ground as soon as the plants appeared. When the old double shovel was called into service, he told the boys to "hold up on the handles," and he kept the hoes going; there were no weeds in his corn field, and he continued hand cultivation longer than the boys could "see any use of it." This careful cultivation brought its reward. His corn continued to yield well. Farmers came in increasing numbers for the seed and carried home with them what was more valuable — his advice.

Without particularly wishing it and certainly without any effort on his part, he found a demand for much of his crop for seed. The variety spread all over Ohio, and Ohio's wandering sons carried it all over the world.

The ideas of corn culture emphasized by Jacob Leaming were an inheritance from his father, Christopher Leaming, and the type developed since 1856 corresponds closely to the type desired by him. There is thus a continuity of ideas and methods reaching back to 1826 or perhaps

earlier. About 1870 Mr. Leaming began advertising his seed corn and soon developed a flourishing seed business which has been continued by his sons, P. D. Leaming at Wilmington, Ohio, and J. S. Leaming, Jr., at Waynesville, Ohio.

Mr. Leaming had very fixed ideas in regard to corn culture, which are of interest to corn breeders. The tapering ear that is so characteristic of this variety is not the result of accident. There is no record to tell whether those first ears secured from that unknown farmer on Bullskin Run had this characteristic or not, but Mr. Leaming very early began to select for it. He did so because he thought it indicated earliness. He believed that the tapering ears were the first to mature; and he wanted the cob to taper as well as the corn. In methods of seed selection he early began the practice of selecting in the standing corn, picking the ears that ripened first, and gathering them just as the husks began to turn yellow. As far as possible he selected from stalks bearing two ears. He believed such ears had succeeded under more adverse conditions and were more likely to make use of an abundance of fertility if given a chance. These seed ears were stripped of a part of the husks and hung up in the crib to dry. The corn remained hanging in the husk until spring, and then a second selection was made, always from tapering ears. The cylindrical ears were good only for the hogs. He believed that corn should mature in a hundred days, and his method of seed selection produced a corn that would do this under his conditions.

Mr. Leaming was a man of keen observation, and the long days spent with the hoe in the corn field were days of

study and thought and observation. He watched not only the developing of the ear, but he studied the whole plant. He wished the stalk to taper as well as the ear, and to be surmounted by a big, spreading tassel. The ears he chose were low down on the stalk. He believed the ears should be on a long branch, as these were better fertilized. He desired an ear that as it matured would drop down along the side of the stalk. He kept all these points in mind in the selection of seed corn.

In hoeing the corn, the boys were always instructed to cut out the weak stalks and those with no ears. In planting, too, Mr. Leaming introduced new methods. He is perhaps the father of drilled corn. One grain in a place, twelve to fourteen inches apart, in rows of four feet apart, was his rule. He believed each plant had a better chance to produce a good big ear if planted in this way than if the ordinary hill method was followed. The method was introduced when corn was planted by the "drop-and-cover" machine, and he was careful to see that the seed was not covered too deep. The sooner the plants got their heads above the ground the better. He wanted to get back into the corn field with the hoe just as soon as possible.

In harvesting his corn he cut it earlier than did the other farmers; he cut it when it was just beginning to turn yellow; and he let the sap in the stalk finish maturing the corn. His reason for this was that he thought the fodder was better, more nutritious, and more palatable than if cut at a later time. Under the ordinary methods then in vogue, the fodder was largely wasted. This Mr. Leaming found to be a valuable part of the crop.

As a disciple of Waldo F. Brown, a clover expert, he

learned to appreciate the value of red clover. He once said in one of his publications:

"The time is not far in the future when red clover will be the grass, not only for the fertilizing of the land, but used almost universally for hay; the first crop cut and properly cut, being superior to any other hay for cattle, horses, sheep, and hogs; the second crop for pasture or to be cut for seed.

"In this we have a sure thing for the restoration of our run down and poor lands. If red clover is properly sown, properly propagated and rotated with other crops of cereals on what are styled worn-out fields, in a few years they can be enriched and made to produce first class crops and to be classed with our best lands, without the assistance of any commercial fertilizer. We make this statement without fear of successful contradiction, and the conclusions are drawn from actual experience and observation. Old, poor, clay fields that would produce nothing but tufts of wire grass, running dewberries, and moss, have in a few years been brought up to be very productive. Proof of this can be well authenticated by indisputable authority. To show how this can be carried out practically, I will give you my plan. In the first place I will break up the land as early in the spring as it will do to plow; harrow well, then sow one bushel of oats to the acre; harrow again, then sow eight quarts of red clover seed to the acre; let what oats grow remain unharvested to protect the young clover from the hot sun of summer and the frosts of winter; turn no stock on the first or second season; the second year, in the month of September, plow under the crop when in full seed, harrow well, sow in wheat; there will be plenty of clover seed in the crop

plowed under to seed it well the next summer after the wheat is harvested. The following May pasture until the first of July, turn off the stock, let the clover grow until seeding time in September, break up and seed down again in wheat, and so on, alternately clover and wheat, for two or three years more, and your land will be so well fertilized that you can put it in corn, and then by rotating with wheat, clover, and corn — corn every third year — your land will not only keep in good condition, but will grow better and richer from year to year."

There is much in these methods that sounds familiar to our modern ears. Most of the things that Mr. Leaming did more than a half century ago have been heralded as new discoveries within the past twenty years. Since our corn breeders have been studying this wonderful plant, they have found that he was right about many of the things that he "believed." But he knew nothing of plant breeding, nothing of chemistry, nothing of plant physiology, nothing of hybridization. He knew only his corn, and he watched it grow. He would doubtless have made more rapid progress had he thoroughly understood the principles of plant breeding, of soil chemistry and bacteriology, but he did not; he worked slowly, ploddingly, but he had ideals. He knew what he wanted, and he got it.

Let us briefly summarize some of the things that Jacob Leaming did which agricultural investigators have at one time or another given the stamp of scientific approval:

He had in mind a type and by continuous selection he fixed it.

He influenced the maturity of his corn by field selection of the early maturing ears.

In selecting his seed corn he considered the whole plant and its surroundings. He avoided unfavorable heredity influences by eliminating the undesirable parents.

A good type of Leaming ears.

He gave good care to his seed corn.

He believed that corn which produced well under adverse conditions was likely to produce seed which would succeed best under good conditions.

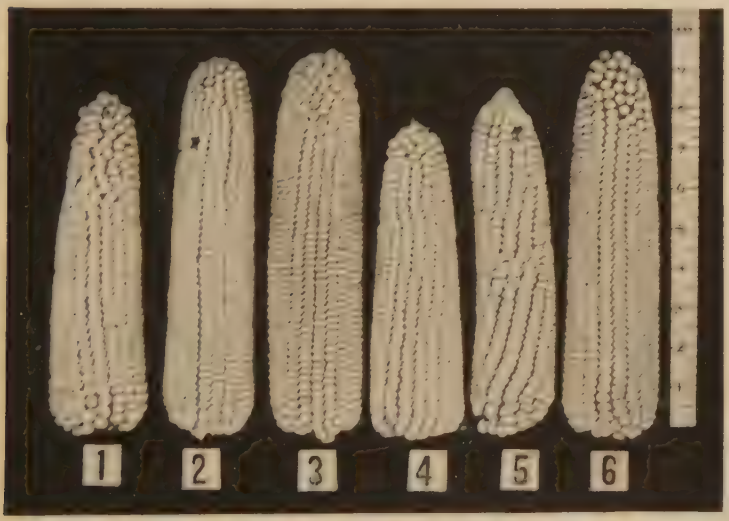
He planted corn in shallow drills, cultivated it frequently, and continued the cultivation late in the season.

He established a short rotation of corn, wheat, and clover; he believed in the value of red clover as a manure crop.

He secured a larger yield of grain from planting in drills than in hills. No excess of labor can be charged against the crop for this method of planting in his case, for he did this at a time when hand cultivation was necessary. In defence

of this method he said: "By actual experience and practice for the past ten years (1883) we know that we can raise from ten to fifteen bushels more per acre, with ears much more uniform in size, than we can raise in hills."

There are a number of strains of Leaming corn grown in various parts of the United States under the name of



Types of Leaming corn from different states: 1. Ohio; 2. Minnesota; 3. Indiana; 4. Connecticut; 5. New York; 6. Pennsylvania.

"Improved Leaming"; the improvement being in the more cylindrical ear, straighter rows, more wedge-shaped kernels, rougher indentations; *i.e.* nearly conforming to the show type. Some field observations would seem to indicate that Mr. Leaming's idea that there was an analogy between tapering ears and earliness had some foundation. At least, some of the types of "Improved Leaming" have been much later in maturing than the original variety.

As the result of an inquiry addressed to our American agricultural colleges and experiment stations, we find Leaming an important variety in every one of the corn-belt states, and widely known in every part of the country. In New England and New York it is the ensilage variety though it ordinarily does not mature its grain in their short growing season, particularly when the seed is secured from the West. There is a strain of Leaming corn grown in Connecticut that seems as well adapted to conditions there as any dent variety that has been tried. It is grown in Canada as an ensilage variety. It is found to some extent in almost all of the Southern States, though it ripens too early and is badly attacked by the weevil in these latitudes. Curiously enough, we again find it as an ensilage in Mexico. In many of these reports from the East, from the far West, and from the South, comes the observation that it possesses a wonderful power of adapting itself to the situation under which it is grown.

The corn originated by Mr. Leaming has an international fame, having been awarded a silver and a bronze medal and a diploma of honor at the Paris Exposition, and a gold medal and a diploma of honor at Melbourne, Australia. In those Expositions, one-bushel samples of corn were shown and the awards were made on the basis of highest feeding value as determined by chemical analysis. Seed from the variety has been shipped by the sons of the originator to many foreign countries.

There are many scientific agriculturists who feel that the great work of Jacob Leaming should be taught to all young Americans, and that should agricultural experts be admitted to the Hall of Fame, he surely deserves a place.

JAMES REID

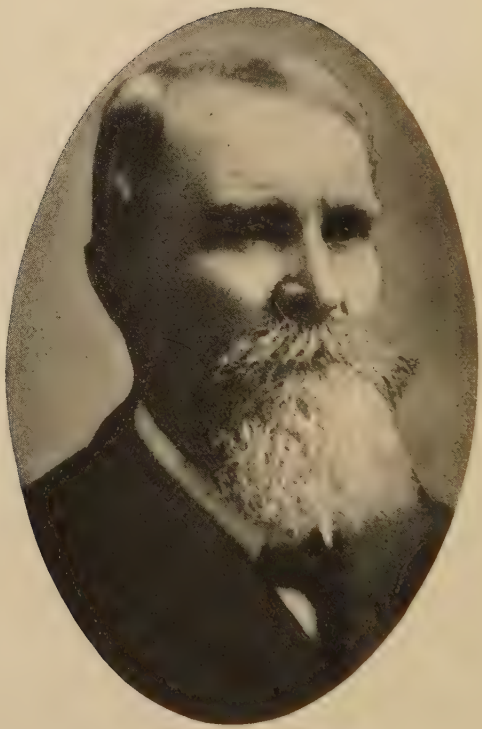
1844–1910

It was said at the National Corn Exposition in October, 1908, that, "James Reid has put more millions of dollars into the pockets of farmers of the Corn Belt than has any other man." *The Country Gentleman* in 1920 said, "James Reid did more than any other man to put the Corn Belt on the map of America."

Nothing ever created in plants has done more for the world than has the development of Reid's Yellow Dent. This creation was the result of the accidental cross-fertilization of two varieties of corn by Robert Reid, and selection by James Reid from his father's accidental creation.

In 1846 Robert Reid moved from Brown County, Ohio, to Tazewell County in Central Illinois, traveling in a cloth-covered one-ox cart known at that time as a prairie schooner. He carried with him a sack of "Gordon Hopkins" corn, which was the best growing variety known in Ohio. This entire sack of "Gordon Hopkins" corn he planted in the rich soil of Illinois. The soil, however, was too rich, or the spring too cold and the season too short, for the yield was not at all what he was accustomed to in Ohio.

The next year he planted the poor little kernels and only about half of them came up. All he could do was to get some native corn, "Little Yellow" as it was called, and plant a kernel wherever the "Gordon Hopkins" did not come up. This necessity caused cross-fertilization, accidental, of



James Reid

course, so he raised neither "Gordon Hopkins" nor "Little Yellow," but the best corn anyone in Ohio or Illinois had ever seen. It was good corn, but it was not famous. It was more than forty years before this accidental corn became well known, and then it was the son, James Reid, who made it famous.

About 1880 corn sold for twenty cents a bushel, and the corn industry had a sharp decline. James Reid then went to Osage, Kansas, and raised wheat, renting his Tazewell County farm; but he returned to his farm and his corn about 1885 and devoted himself to the selection of seed corn. Not more than one ear in twenty did he think good enough for seed. His neighbors laughed at him for being so particular, but in 1891 he took first prize at the Illinois county fairs and at the Illinois State Fair, and in 1893 he won medals and diplomas at the World's Columbia Exposition in Chicago. At the National Corn Belt Exposition in Omaha in 1908 James Reid was recognized by everyone as the really great leader in the promotion of the corn industry.

Mr. Reid's "Yellow Dent" is so hardy that it is successfully raised over a wider area than is any other variety. It is said to be the best variety in any corn-producing state in the Union, in South America, in Africa, and in Russia — a record that no other corn has held.

The "Little Yellow" which Robert Reid accidentally and of necessity crossed with the "Gordon Hopkins" was a tough little ear, a variety which the Indians had raised in the rich soil of the Middle West before the days of La Salle, Marquette, and other missionary pioneers.

In these later days it is easy to create new varieties with any quality desired. Experts can cross-fertilize for special

varieties to feed hogs for rapid growth, or for dairy cattle, or for egg-laying hens; but James Reid developed his classic in the corn world before these ways were known. By patient selection, by picking out the one wonderful ear in twenty, he developed the master variety for the greatest range of the best qualities. Reid's "Yellow Dent" corn has probably done as much as any other known plant to distinguish the United States as a great food-producing nation.

PETER HENDERSON

1822–1890

Peter Henderson was born in Pathhead, a village twelve miles south of Edinburgh, Scotland. He was sent at an early age to the parish school where he first exhibited that marvelous industry which all through life was his distinguishing characteristic.

The amusements of country lads in the south of Scotland at that date were limited, their spare time being mostly spent in hunting for bird's nests and for the eggs of jackdaws (a small species of crow). The ruins of Crichtoun Castle, so graphically described by Sir Walter Scott in his poem of "Marmion," are but a short distance from where Peter Henderson passed his boyhood days.

> "Crichtoun! though now thy miry court,
> But pens the lazy steer and sheep,
> Thy turrets rude, and tottered keep
> Have been the minstrel's loved resort.
> Oft have I traced within thy fort,
> Of mouldering shields the mystic sense,
> Scutcheons of honor, or pretence,
> Quartered in old armorial sort,
> Remains of rude magnificence."

The old ruin was a great resort for jackdaws, and Peter Henderson was ever fond of telling of the risks he and other youngsters took in hunting there for their nests. A story is told of him which illustrates his fertility in resource. He could not have been over seven years old when an old gun a

foot or two taller than himself came into his possession. He had powder, but no bullets. He remembered that in the rear of Crichtoun House (the residence of his father's employer), the lower windows were protected by iron bars, sunk in stone and soldered with lead. He got all the lead there that he needed for bullets. Fifty-five years afterwards in visiting the scenes of his boyhood, he took Mrs. Henderson to see the spot where he had obtained the lead for his bullets. To his astonishment the holes had never been filled up, and the traces of his jackknife were still plainly visible.

At the age of sixteen his opportunity came when he was indentured as an apprentice in the gardens of Melville Castle, situated near Dalkeith, which under the direction of the head-gardener, George Sterling, was considered the best training school in all Scotland. Mr. Sterling was a great disciplinarian, and such of his apprentices as were able to stand his four years' rule had but little trouble afterwards in securing positions.

Mr. Henderson's old and lifelong friend, Mr. Hugh Wilson, now of Salem, Massachusetts, who was then employed in the gardens of Melville Castle, suggested that he should become a gardener. As soon as he entered on his work at Melville Castle, he became enthusiastically interested, especially in botanical nomenclature. He had been only a few months in his new position when Mr. Ballantyne, a nurseryman in Dalkeith, asked Mr. Sterling to name his collection of hardy herbaceous plants which had become badly mixed. Mr. Sterling replied that he would send one of his young men to name them. He selected Peter for the task. The naming was done so quickly and so correctly that Mr. Ballantyne rewarded the youth with a sovereign and complimented him

PETER HENDERSON

on the good use he had made of the short time he had been at the business. In his talk with him, Peter told how during the summer he had employed his spare time in making an herbarium to familiarize himself with botanical names. Mr. Ballantyne told him to bring it to him when finished, and he was so much pleased with it that he presented the boy with a silver medal which he had intended to offer as an herbarium prize to a local society.

The following season Peter Henderson won a medal offered by the Royal Botanical Society of Edinburgh for the best herbarium of native and exotic plants, a competition open to the whole of Great Britain. This gave him a practical knowledge of botany which was afterwards of great benefit to him as a horticultural writer.

The gardening course at Melville Castle covered four years. The first year he received nine shillings a week, the second ten shillings, the third eleven shillings, and the fourth twelve shillings; a shilling being equal to twenty-five cents of our American money. Out of these wages the young man fed and clothed himself but was lodged in a building connected with the greenhouses and known as the "Bothy." Life in the "Bothy" was free and easy and on the whole rather comfortable. Each apprentice took his turn a week at a time, to cook and do the housework.

In the spring of 1843 Peter Henderson arrived in New York, after a six weeks' voyage in a sailing vessel.

On the threshold of his American career, he met with an experience, for which many a struggling gardener had in after years reason to feel grateful. After landing, he started out to look for work, and, as many gardeners did in those days, and do now, called first at a down-town seedstore. He

courteously asked the proprietor if he had a situation open for a gardener. The proprietor, who was seated reading a newspaper spread out on the desk before him, did not even take the trouble to look up from his paper but gave him the surliest kind of "No," for an answer. The almost brutal manner of his reception made such an impression on the youth, that before he reached the sidewalk he vowed that, if the time ever came when he should be in a position where men applied to him for assistance in finding situations, he would always remember to treat them courteously and kindly, even if he could not aid them.

Among the many thousands of letters of sympathy and condolence received by Peter Henderson's family after his death were hundreds from private gardeners, and nearly always the burden of their message was, "I have lost my best friend."

After his rebuff at the seedstore, he secured employment in the nurseries of George Thorburn, at Astoria, Long Island, where he remained a year. Thence he went to Robert Buist, Sr., at Philadelphia, then the leading nurseryman and florist in the United States. Mr. Buist was at once impressed by the young gardener's energy and industry, and a warm friendship sprang up between them. In after years Mr. Buist said that Peter Henderson was the best and most skillful workman he ever had. From Philadelphia he secured a position as private gardener with Mr. Charles F. Spang, of Pittsburgh. He travelled by canal from Philadelphia in charge of greenhouse material; and Mr. Henderson often spoke of this trip as a delightful experience, lasting as it did for nearly three weeks of pleasant weather, giving him ample time and opportunity to botanize by the way.

In 1847 Peter Henderson, in partnership with his brother James, started in the market garden business in Jersey City. After a few years they dissolved partnership, James Henderson buying new grounds and Peter continuing at the old place. As he found the taste for ornamental gardening increasing, he began to add to his greenhouse department, which eventually superseded the market garden, but for years he personally and successfully conducted both the market garden and greenhouse departments, spending more than half of his working hours in his shirt sleeves, often drenched to the skin while leading his men in some active operation out of doors.

He bought a plot of ground of about six acres back of Jersey City, which he cultivated until about 1863, when the greenhouse department became so extensive, and its demands on his time so exacting, that he sold the "Back Lane" place and devoted himself to the Jersey City establishment, which by this time, in addition to the market garden, included twelve greenhouses, besides a large number of pits and frames.

About 1853 he opened an office in New York with McIlvain & Orr, afterwards McIlvain & Young, at 9 John Street, where during the spring and early summer months he sold and took orders for delivery the next day of such greenhouse and vegetable plants as were in season.

In 1864 he gave up the grounds he had so long occupied in Jersey City and moved to what was then known as South Bergen, a mile distant from his old place. Here he had been buying from time to time until he had secured nearly ten acres. On this he erected what was at that time considered a model range of greenhouses, heated and ventilated in the

best methods then in vogue. This range of glass structures was visited by hundreds of florists to whom it served as a model for years.

In 1880 all these houses were reconstructed, as experience had shown they could be improved upon; so a second time his greenhouse establishment served as a model and as such it still remains. At the time of his death this part of his establishment covered over five acres solid in glass.

While thus busily engaged in all operations of the greenhouse and garden, he was a frequent contributor to the various horticultural journals; the *Gardener's Monthly*, the *Horticulturist*, *Tilton's Journal of Horticulture*, and the *American Agriculturist* rarely issued a number without something original and timely from his pen.

He retained his office at 9 John Street until 1862 when James Fleming and William J. Davidson, two bright young Scotch gardeners, opened a seedstore at 67 Nassau Street. He then moved his office to their store, abandoning the auction, and relying for the development of the business on the annual catalogue and newspaper advertising which he had begun. In 1865 he bought Mr. Davidson's share in the seed business, the firm then becoming Henderson & Fleming. He continued with Mr. Fleming for six years when the partnership was dissolved.

In 1871 on his forty-ninth birthday, he established in Cortlandt Street, New York, the seed business now known as Peter Henderson & Co. He was the first to conceive, as early as 1872, the idea of offering to the horticultural public the opportunity of procuring all their supplies from one firm. This idea was quickly perfected in its details and found its expression in a phrase of his own coinage, "Everything for

the Garden," a term in a business sense almost synonymous with the name of Peter Henderson.

His long experience as a market gardener probably made him realize more than most seedmen, the necessity of testing seeds before offering them for sale, but, whatever the cause, the fact remains that he was the first in this country to initiate the true and natural way of proving the vitality of seeds; that is, by sowing them in the soil, the seedsman's usual plan being to germinate them in moist cotton or flannel. Not only this, but annually in his trial grounds he made certain of their purity by thorough comparative tests. His judgment as to the value of new varieties of both seeds and plants was almost infallible; and most of the novelties which he endorsed have stood the test of general culture and are to-day recognized as standard varieties.

In 1874 the New York Horticultural Society, after being practically defunct since 1860, was resuscitated, largely through Mr. Henderson's efforts. He gave a considerable portion of his time to its reorganization, and though he would never accept any prominent office, he attended all its meetings faithfully, and by his contributions to its various exhibitions and his liberality in offering special premiums for essays and exhibits at its monthly meetings, assisted materially in making it a success. He was also a zealous member of the Society of American Florists and, recollecting his own early experience, at the convention held in Chicago in 1888 offered a premium of one hundred dollars for the best herbarium of native plants gathered within the year, and correctly named, to be competed for at the meeting at Buffalo the following year. This offer brought out several excellent exhibits, the second best of which was so good

that he voluntarily gave fifty dollars as an award for the painstaking manner in which it was mounted and arranged.

Any record of the business career of Peter Henderson would be incomplete if it overlooked the skill and originality displayed in the preparation of his plant and seed catalogues. Until within his last ten years, he personally wrote and prepared all the matter for the plant catalogues, and, after the seed department had been added, he also wrote the important portions of it for many years.

His first book, *Gardening for Profit*, was written in the summer of 1866. Although he was then well known as a horticultural writer, when he was approached by the late Dr. Thurber, then editor of the *American Agriculturist*, on the matter of writing this book, he refused to attempt it because he felt that writing a book was beyond his power. He was finally persuaded to make the attempt. He wrote this remarkable book in the incredibly short time of one hundred hours. By this it is not meant that *Gardening for Profit* was produced consecutively in that time, but the aggregate of time spent on the book was within the limit named. This work brought a national reputation to its author, and its value to the United States is beyond computation.

The great success of his first book stimulated him to produce in 1868, *Practical Floriculture*, which was written to teach how flowers and plants could best be grown for profit. This book did for æsthetic gardening what its predecessor had accomplished for material horticulture; it established thousands in a safe and profitable business. In 1875 he published a third work, *Gardening for Pleasure*, which has fully met the wants of those desiring information

on gardening for private use, and who have no desire to make it a business.

In 1881, appeared the most pretentious work he had yet attempted, Henderson's *Hand Book of Plants*. This was a condensed encyclopedia of over four hundred pages, giving the botanical classification, methods of propagation, and culture of both useful and ornamental plants. In 1889 the work was rewritten and greatly enlarged.

His fertile mind opened up an entirely new vein in 1884, when, in conjunction with Mr. William Crozier, one of the best known and most successful farmers in the country, he produced the work, *How the Farm Pays*.

Except for the usual royalties on his books, paid to him as an author, Mr. Henderson did not accept pay for his writing, giving his aid freely to the various horticultural journals.

Peter Henderson lived nearly all his life in Jersey City, where as citizen, friend, and neighbor, no man stood higher in the estimation of the community. There it was that he established his roof-tree, after his marriage in New York City, in 1851, to Miss Emily Gibbons, a native of Bath, England, the daughter of Mr. Thomas Gibbons, and the mother of his three children, Alfred, Isobel (now Mrs. Robert M. Floyd), and Charles.

His eminence in his profession brought him into personal contact with many men of national reputation, but of all the public men that he knew, perhaps the one he most admired was the Reverend Henry Ward Beecher. The great preacher's well-known love for flowers first brought them together, and it was a treat to see these two men, each so eminent in his own sphere, become as enthusiastic as school boys over some marvel or beauty in flower or leaf.

In horticulture, either here or abroad, in certain respects he had no prototype. The annals of the profession may be searched in vain to find where any one man attained a degree of eminence equal to that which Peter Henderson secured at one and the same time, in three distinct divisions of horticulture. To have been the leading florist, the great seed merchant, or the versatile horticultural writer, would have been fame enough for most men. So when it is considered that he held almost the highest rank in all three departments, we begin to understand how wonderful his genius and his industry must have been.

Mr. William R. Smith, for nearly thirty-five years superintendent of the Botanic Gardens at Washington, and a man highly distinguished for his botanical research, paid him the highest possible tribute in terming him "the great horticultural missionary."

Mr. A. D. Cowan paid a beautiful and appreciative tribute to his memory in a paper read before the New York Florists' Club, March 10, 1890. Among other things in his eloquent address Mr. Cowan said:

"No man ever lived who carried on his researches under greater difficulties, and no one ever exercised greater perseverance to gain a full knowledge of the subject which claimed his attention. No one but he handled the pioneer's pen which brought the dark, selfish, and ignorant methods of the old School of Horticulture into daylight; and to Peter Henderson will belong for generations to come the credit of popularizing, improving, and developing gardening in these United States."

Perry Greeley Holden

PERRY GREELEY HOLDEN

1865–

Perry Greeley Holden was born in Dodge County, Minnesota, but in 1871 his parents moved to Almira Township, Benzie County, in the back woods of Michigan where the boy and his two brothers attended a rural school. It was in this school that a teacher gave him a motto which has been his life slogan: "This day I will beat my own record." In those days he had the unique experience of having at different times as teacher in the rural schools his grandfather, his father, and his mother.

His father was a surveyor, and, as a boy, Perry Holden assisted him in that work, himself becoming expert. He also helped his father on the farm and in the winter months taught school to secure money to pay his way through college. As he never went through high school, it was necessary for him to pass a special examination for admittance to college. In order to prepare himself for this examination, he got up at three or four o'clock every morning to study and took his books to the field with him when at work on the farm.

He was graduated from the Michigan Agricultural College with the degree of Bachelor of Science in 1889, and was fellow instructor in the same college from 1889 until 1893. In 1895 the college conferred upon him the degree of Master of Science. In 1894 he was graduated from the State Normal School of Michigan at Ypsilanti, which conferred upon

him the degree of Bachelor of Pedagogy in 1894 and the degree of Master of Pedagogy in 1912.

He was professor of science at Benzonie College, Michigan, in 1895, and was County Superintendent of Schools in Benzie County in 1895 and 1896. From 1896 to 1900 he was professor of agronomy in the University of Illinois where his efforts resulted in the erection of a $200,000 agricultural building on the college grounds.

During his four years with the University of Illinois Mr. Holden organized the Corn Growers' Association and the Sugar Beet Growers' Association, assisted in establishing the Corn Breeders' Association, organized America's first corn-judging school, originated the Illinois Club, the object of which is to disseminate agricultural instruction among young men, and assisted in building up the State Farmers' Institute.

He was agriculturist for the Illinois Sugar Refining Company in 1900 and 1901 and in 1902 organized the Funk Brothers' Seed Company for the scientific breeding of corn.

In order the better to study corn he hired out to farmers during the summer vacations, working for one farmer for a while, then riding on his bicycle to another part of the state and hiring out to another farmer. In this way he was able to study the methods employed by farmers in corn growing.

While at the University of Illinois, he did his first extension work. This was in corn breeding, chemical analysis of soils, and the effect of different treatments of soil in corn breeding.

Mr. Holden remained with the University three and a half years and then accepted the appointment of superin-

tendent in charge of field work for the Illinois Sugar Refining Company.

People said, "Well, Holden has got into commercial work; he is lost to the educational world." But he only smiled. He knew it would give him a chance to mingle among active farmers, to learn their ways and methods, to gain experience. He knew it would be a portion of his education, the carrying out of the plan he had previously adopted.

While with the sugar company his idea of extension work was broadened. He had previously conceived the idea of carrying information to the people, and he now learned how this could be done.

In Canton, Illinois, an extension class from the University was conducting a meeting. Mr. Holden attended. Only twenty-four people were present, but they were from among the more intelligent and influential members of the community.

"Instead of trying to help twenty-four people who do not particularly need help, why not go out and teach twenty-four thousand people who do need help, how to grow sugar beets?" Holden said to himself.

He carried out his idea and his meetings were most successful. They attracted the attention of two brothers named Funk, who had inherited a fine farm. They went to Perry Holden. "How can we use our farm so it will be most helpful to the world?" they asked him. He told them to grow corn, to breed corn, and to improve it. They asked Mr. Holden to take charge of the farm; he accepted.

During the first year of his management of the farm, Mr. Holden went to Iowa to hold a short course in corn culture. At the conclusion of the short course, W. M.

Beardshear, then president of the Iowa Agricultural College, said to him, "You are an educator. We want you."

The college, however, was not able to pay the salary necessary to secure Mr. Holden, and a number of the real friends of agriculture in Iowa, including the Iowa Grain Dealers' Association and Henry Wallace, editor of *Wallace's Farmer* and father of Secretary of Agriculture Wallace, contributed enough from their own resources to make up the difference.

The college had no agronomy department at that time, but one was organized and Professor Holden placed in charge of it. Before long, divisions of soil, crops, farm machinery, and farm mechanics were established, a competent director for each appointed, and good courses of study adopted.

Professor Holden did not believe that the college was for the use of only those who were able to attend it. He felt that every person in the state who paid taxes was entitled to profit by the institution. He considered that the functions of the college should be threefold.

First: Education of the students. .

Second: Experiment on the farm and in the laboratory.

Third: Diffusion among farmers of conclusions from experiments.

One year, when the corn yield was poor, Professor Holden was called to Des Moines to address the Grain Dealers' Association. He emphasized the need of testing corn and demonstrated how easily this could be done. The result was that arrangements were made for running a number of special trains over various railroads, bearing several lecturers and demonstrators, headed by Professor Holden, to impress upon the farmers the necessity of testing their seed corn.

This was the first extension work ever carried on in this manner.

On one occasion he attended a meeting of farmers in Sioux City, Iowa. The work being done at the agricultural college came up for discussion.

"Conditions differ in different parts of the state," said the farmers. "Experiments conducted at Ames may be worthless in Sioux County. We have a good county farm. What we need is an agricultural college man to take charge of the farm and conduct experiments right here."

Professor Holden saw the immense value of the suggestion, and the result was that he began to encourage the county agent movement which now covers the entire country, and the county farm demonstration work which swept over Iowa and many other states.

The result of these movements made it clear that the Iowa Agricultural College needed an extension department. Such a department was organized and Professor Holden appointed its director. He had been with the college four years and willingly agreed to remain because, as the head of the extension department, he would be enabled to visit all parts of the state, come in contact with thousands of farmers, learn their methods, and thus continue his studies in accordance with the resolution he had adopted at the outset of his career. As the result of his labors, the extension service of the college was carried to every part of the state and into other states.

Professor Holden soon learned that it is hard to change the habits and customs of older people. He saw that the agricultural future of Iowa was in the hands of the boys and girls. He organized corn clubs, pig clubs, and poultry

clubs and enlisted thousands of young folks in these. The next generation of farmers proved the wisdom of his course.

During his ten years at the Iowa College of Agriculture, he organized short courses for the study of corn, first at the college, and later at many places in Iowa; enlarged and extended Farmers' Institute work; conducted campaigns in the interest of corn clubs, granges, farmers' clubs, commercial clubs, publicity clubs, and other development organizations; organized and conducted the first seed corn trains ever operated; and prepared the manuscript and illustrations for five different books on corn culture, of which American editions have exceeded one million copies. One book was translated into Spanish and published for circulation in Mexico at the request of President Diaz of that country. This book has been published also by the governments of Spain, Russia, and Argentina. *Bulletin No. 77*, on Seed Corn, issued by the Iowa Experiment Station and based on Professor Holden's investigations has been widely distributed.

In 1912 Cyrus H. McCormick, then president of the International Harvester Company, summoned Mr. Holden to Chicago. Mr. McCormick believed that the Harvester Company, with its ninety branch houses in all parts of the country and a dealer in practically every city, town, and hamlet, was in duty bound to do something to help build up every community in which it did business. He believed that the company should devote some of its resources to building up the agricultural interests of America.

Mr. Holden saw that Mr. McCormick had a worth-while vision and agreed to organize and direct an agricultural

extension department as a part of the Harvester organization, a task he carried out with success.

Since this department was organized, Professor Holden and his assistants have conducted short course or community meetings for agricultural education which have been attended by 1,800,000 people; have prepared lecture charts, lantern slides, and moving picture films, which have been loaned to county agricultural agents, teachers, and others; have published educational booklets, of which six million copies have been distributed; and have prepared educational articles which have appeared in numerous American publications.

Mr. Holden believes in anything that makes better farming, better farms, better homes, and better communities. In many sections he has started people on the road to diversified farming. He believes in giving the soil a square deal. He believes in alfalfa, in silos, in living on the land and having a home there — not just farming for the sake of growing crops.

When the European war knocked the bottom out of the cotton market and many farmers in the cotton belt faced bankruptcy as the result of the one-crop system of farming, Mr. Holden, with a corps of sixty trained agricultural lecturers, went south and conducted a series of campaigns covering six states and lasting one hundred and fifty-five days. They held nearly six thousand meetings, addressed over half a million people, traveled over three hundred thousand miles by railroad and automobiles, and distributed free over two million bulletins, the total weight of which was over eighty tons.

The purpose of the campaigns was to show the cotton belt farmer how to feed himself and to point out the necessity of diversified farming. How well this was done is indicated

by the fact that Arkansas alone in one year raised twenty million more bushels of corn, half a million more bushels of wheat, two and a quarter million more bushels of oats, and one and a quarter million more bushels of potatoes, increasing the value of the produce of the state by $30,000,000.

When he is out in an alfalfa patch digging up the roots, Mr. Holden is as happy as a boy digging a rabbit out of a hole. He would rather be out on a farm among farmers than anywhere else, and in his campaigns he insists that most of his meetings shall be held on the farms as it is there he can best talk to farmers on matters which concern them.

He preaches the gospel of better farming from the viewpoint of its effect on homes, lives, and human welfare. This is well demonstrated by the following extracts from some of his recent addresses:

"Every good citizen realizes that he must do many things to help build up the community in which he lives, apart from just the things he is required to do by law, or the things directly beneficial to himself. In the same manner, too, every business concern doing business in a community is under obligations to do many things in its community which are not directly connected with, or even directly beneficial to it.

"What we are all concerned in more than any other thing is humanity, right living, better homes. If we are to help the world and humanity, we must help them through the things that concern them; through the things they give to the world — their days, their toil, their labors. We must teach in terms of the lives of the people.

"To accomplish the most in agricultural development we must begin with the man who produces the crop. To render

him the most efficient service we must meet him where he lives, study his conditions, and aid him according to his needs.

"When I see people at work, it sometimes seems to me that they are just working for their pigs, for their cattle, for their corn, for their wheat. We ought to make this corn work for us. We ought to make the wheat and pigs and cattle work for us. The only interest I have in these things is the real benefit that may come to us, to our homes, to our children through the things we produce."

Under Mr. Holden's direction the extension department of the International Harvester Company has, in one way or another, helped men and women and boys and girls in every state of the Union, Alaska, Hawaii, the Philippines, Canada, Mexico, Peru, Argentina, Porto Rico, Holland, Russia, and China.

JOSEPH E. WING

JOSEPH E. WING

1861–1915

Joseph E. Wing, known to his many friends and admirers as "Joe" Wing or "Alfalfa Joe," was born in a plain little house, on a poor hill farm near Hinsdale, Cattaraugus County, New York. His parents were William H. and Jane Bullard Wing; both of whom were descended from pioneer New England families.

In this picturesque though not very fertile region, young Joseph grew to boyhood in much the same way as all farm boys of that day. He attended the country school; he learned the simple farm tasks. Then his father decided to go west in search of a richer soil and kindlier climate. When Joseph was six years old, the Wing family moved to Ohio, settling on a small farm near the village of Mechanicsburg, Champaign County. This new farm proved to be a decided improvement over the more rugged and less productive place they had left. It was well laid out, and fairly productive, consisting of both level and rolling clay upland, underlaid with gravel and well supplied with mineral elements, particularly limestone; there were also some poorly-drained bottom lands. There was a fine bit of woodland, from which the name Woodland Farm was later taken. The farm was situated where the rolling hills from the west flatten themselves out to join an extremely fertile region now widely known as the "Darby Plains," then little appreciated because of its marshiness.

The farm had a fair equipment of buildings, more were built, and others were added along with small land purchases until a total of 196 acres was secured. The elder Wing farmed about fifty acres of this tract, tilling it thoroughly and painstakingly as had been his custom back in "York State"; the remainder was left in pasture or woodland. He practiced a three-year rotation, fattened a few cattle and hogs, and raised a small surplus of fruit and vegetables, all of which was sold to the best advantage possible in the local markets. Times were not good, but by hard work and frugality on the part of the entire family, they managed to eke out a fair living and to save a little besides. These savings were shrewdly invested by the elder Wing, mostly in farm mortgages.

Such was the physical environment of young Joseph. He spent a few years in the district schools, one year in town high school, and later a year in Elmira Academy, New York. He worked hard with his father, who was a rather stern taskmaster. The strength of the father was enormous. Of powerful physique, he toiled unsparingly and expected his associates to keep up with him. Gruff in exterior, he was kindly underneath, and a Puritan at heart. Mrs. Wing, also a Puritan and deeply religious, was of a gentler strain. Slender and frail, gentle, beauty-loving, she was in many ways the exact antithesis of her husband. She liked poetry; did occasional sketches; wrote fascinating letters. Her beds of wild and cultivated flowers were a revelation to the passer-by. The boy Joseph inherited the outstanding traits of both parents.

He had the iron will and indomitable energy of his father; and, although lacking his father's superb strength, he was

far from being a weakling. From his mother he received a goodly share of gentleness and love for the beautiful, especially a fondness for flowers; from her also came the ability to express himself in words. From some of his pioneer ancestors he inherited the wanderlust spirit, an impulse which took him away from home at an early age and later carried his feet into practically every corner of the United States and into many a distant land.

Answering the call of the wanderlust, and, also, probably tiring of the humdrum life of the home farm, Joseph went to Utah in March, 1886, finding work on a cattle ranch near the junction of the Price and Green Rivers. He came to love this life of the range, which in those days was exciting enough to thrill even a present-day movie devotee. He learned quickly and was soon made foreman. In addition to grazing cattle and sheep, this ranch devoted considerable energy to the growing of alfalfa in irrigated valleys. Joseph liked this work. Alfalfa with its repeated cuttings of luxuriant green foliage, which made such valuable hay, seemed to him a marvelous crop. He sent some seed home to his father, urging him to plant it on the home farm. The father did sow a small plot, but when Joseph made a visit home in the summer of 1888, he found only a few scraggly plants. On closer inspection, however, he learned that the reason the plants were so small was that the farm chickens kept them stripped of leaves. So he took a barrel, with the ends knocked out, and placed it over a few plants, watering them carefully. In a few weeks the alfalfa grew out of the top of the barrel. But the elder Wing refused to be convinced, saying that he didn't want a crop that "had to be grown in a barrel."

Joseph eagerly returned to the Utah ranch. He loved the

bigness and enterprise of the West. He had dreams of what his future might be in that land of golden opportunity. But the following year his father begged him to return to help with the home farm, as the elder Wing was beginning to show the weakness of age. Reluctantly the lad returned and took over the reins from his father's hands. He was amazed to find that the farm produced so little; the entire sales for a year amounted to only $800.00. He took hold, determined to make the farm really productive and profitable. That winter he built a cottage, and in the spring he was married to Florence Staley, a girlhood sweetheart, whom he had dreamed of making queen of his western mesas. Then started a struggle of the kind about which young farmers to-day know little.

Times were bad, as all who knew the early nineties remember. Joseph took that farm by the middle, determined to conquer it or know the reason why. Alfalfa and lambs were his program. But first he had to prepare the land so that it would grow alfalfa. Some of the fields were wet, these he drained; other fields were poor, onto these he hauled hundreds of loads of manure. Lime had been provided by Nature; inoculation was there likewise, probably from sweet clover, as no one knew then that alfalfa needed inoculation. The acreage under cultivation steadily increased; the alfalfa fields steadily grew larger; each year there was feed for a larger flock of western lambs, which meant more manure, more alfalfa, and better corn. The farm began to pay!

It must be understood that at that time scientific agriculture was just beginning to be talked of. There were certain general principles and many wise farming practices

which had been handed down from farmers back to the days of the Romans, and which we know to be as sound to-day as they were ever supposed to be. Some scientific experimental work had been done. But there were wide gaps in the store of farming knowledge that left much to the originality and observation of the individual.

Alfalfa was a mystery which was yet unsolved; it had never been grown successfully in Ohio and probably not in any state east of the Mississippi River until it was grown by "Joe" Wing. No one knew why, but, nevertheless, it was a fact that there was something about eastern soils which made them unsuited to alfalfa. Everybody who knows anything about farming knows now that alfalfa requires a limestone soil, well-drained, and supplied with the right kind of bacteria. But Joe Wing did not know this at that time, nor did anyone else. He found out by hard work and bitter experience, back of which was always the actuating force of faith that he would eventually succeed in growing good alfalfa.

Now Providence, or some other unforeseen force, had put Joseph on a farm where the most essential elements for success with alfalfa were already provided. Not every farm in Ohio has a limestone soil, nor do all of them harbor the alfalfa bacterium. Woodland Farm had these vital elements, so he had no great difficulty getting alfalfa to grow, except where the land was poorly drained. He did, however, have difficulty making it thrive as he had seen it thrive in Utah. He worked on this problem for twenty-five years before he learned the principal secrets of this great legume, although he was growing profitable crops before the fifth year had passed. To the alfalfa essentials already mentioned

— lime, drainage, inoculation, manure — should be added phosphorus, and occasionally potassium and sulphur.

Of course, Joseph Wing does not deserve, nor did he ever claim, all the credit for learning the secrets of success with alfalfa; he learned much from agricultural colleges and

Alfalfa demonstration meeting. Mr. Wing invited hundreds of friends to his farm so he might demonstrate to them certain facts that were difficult to bring out in his famous lectures and writings upon "The Growing of Alfalfa."

experiment stations, and from other farmers. He was, however, the first to realize fully the possibilities of this great clover in eastern farming, and the first, as far as is known, to grow it successfully in the East. Furthermore, he spread the gospel of alfalfa culture and better farming in general from Coast to Coast, and from the Great Lakes to the Gulf, as perhaps no other man has done. Moreover, he did it with

such contagious enthusiasm that men believed him and eagerly followed his advice.

Alfalfa growing was probably the biggest contribution Joe Wing made to American agriculture although he made other contributions. His love for sheep led him to start a flock of pure-bred Dorsets on the farm. His enthusiasm for this breed, which at that time was almost unknown in this country, made him expound its superior qualities in glowing terms. He was given the secretaryship of the Continental Dorset Club, an office which he held and carried on creditably for many years, until, in fact, the Dorset had taken its rightful place in the American sheep industry.

He was one of the first advocates of the open-center, plank, or joist-frame barn, which has now come into general use. For many years he sold plans and barn models of this type of structure to farmers all over the United States. He helped develop a superior type of seed corn, particularly suited to the conditions found on Woodland Farm, where yields of 100 bushels to the acre in good-sized fields are not unknown. He was always a booster of any movement which meant better farming practice, or better farm living.

A few years after Joseph returned to take up the arduous duties of working the home farm, his father died; passed peacefully away while driving to town with some produce. The two younger brothers, Willis and Charles, who likewise had done their turn on the same Utah ranch, joined Joseph in the work of making over the old farm. To them goes the credit for putting into practice the program which the three brothers worked out together. Joseph's time gradually became absorbed by journalistic, advisory, and lecture work.

He had the gift of speaking no less eloquently than he wrote. Although thoroughly practical, he had a happy way of revealing the spiritual side, the poetic side of farming: he saw and made others feel the joy and beauty in ordinary farm work. He put inspiration into jaded farm men and women; he showed them that farming can be made the happiest and most wholesome life of all.

About 1898 he became correspondent for *The Breeder's Gazette*. He served this paper, which has always stood for the finest things in farm life, until he died. For it he traveled into every one of the United States; he explored Mexico and Canada; he made two trips to Europe where he saw and wrote of the achievements of the most representative farmers and breeders. When President Taft made his famous tariff investigation, Joseph Wing was chosen as the man best qualified to investigate the sheep industry, and he spent several months in Argentina and other countries for the purpose of learning the truth of the South American wool business. He wrote five books, three of which are standard: *Alfalfa in America* is perhaps best known; with it rank *Sheep Farming in America* and *Meadows and Pastures*. *The Winter Lamb* is a book about Dorset sheep, and *In Foreign Fields* tells of his travels in South America and Europe.

It was but natural, as the reputation of alfalfa spread throughout the East and Central West, that people should want to know of a reliable source from which to buy seed. The Wing brothers started supplying this seed, first as an accommodation; later, they were forced to charge a profit to cover the expense of handling. Gradually, the demand for high-grade farm seeds of all kinds grew to such an extent

that The Wing Seed Company was formed. This firm has always stood for and endeavored to encourage all that is best in the cultivation of field crops. Joseph Wing was president of the firm, and his brothers have kept the business to its original high standards since his death.

Woodland Farm to-day is a quite different place from what it was when Joseph first took charge. Probably there is no general farm in the country more fertile, thanks to alfalfa, sheep, and phosphorus. Its line fences have stretched until the acreage is almost double the original one hundred and ninety-six. There are more barns, but even these can not contain all the hay grown in some years. The last flock of lambs fed numbered fifteen hundred. The little cottage was outgrown and a larger and more modern home erected in the corner of the woodland, surrounded by mighty oaks. Here Joseph planted the trees and flowers he loved; a purple beech, pines, blue spruces, a Japanese barberry hedge, irises, mallows, ramblers, peonies, and many others. He made it a beauty spot that compelled touring automobilists to slow up, and even to stop, to look with admiration and surprise at a farm home which showed such a remarkable combination of utility and beauty.

In the fall of 1914 Joseph Wing was thrown from a buggy by a frightened horse and suffered a dislocation of his shoulder. It slowly grew better, but before he recovered, he was stricken with what appeared to be a nervous breakdown. In spite of the best medical attention obtainable, he grew steadily worse until, after his strength had been exhausted, the disease was diagnosed as pellagra. He died a few days later, in September, 1915. Thus ended the career of a man who rightfully should have lived many more useful and

happy years. He was fifty-four when he died. Certainly no one may say that the years he lived were wasted. He is survived by his widow and three sons, Andrew, David, and William, of whom the first two are engaged in agricultural work.

WILLIAM DEMPSTER HOARD

1836–1918

William Dempster Hoard was born in Stockbridge, Madison County, New York. Originally the name was Hoar, the family being the same as that from which came Senator Hoar of Massachusetts and Congressman Hoar of Michigan. The "d" was added to the name by William Dempster Hoard's great-great-grandfather in 1760.

Mr. Hoard delighted to tell of the days spent with his grandfather on the old homestead. On the mantle over his office fireplace there was a grain sickle which his grandfather had used when William Hoard was a small boy. One day when he was but nine years old, unobserved by his grandfather, he took the sickle and attempted to cut grain. All his life he had a scar on his finger as the result of his first trial as a harvest hand.

When sixteen years of age, he began to work for a well-to-do dairyman named Waterman Simons, who taught him to make butter and cheese. Mr. Simons kept a herd of fifty cows that averaged above six hundred pounds of cheese each year, and it is easy to see where Mr. Hoard received his early knowledge and inspiration for this industry.

He went west in 1857 and, having joined the Methodist church at Lowell, Wisconsin, studied to become an exhorter and received a license to exhort; but differing with the Presiding Elder over some of the doctrines of the church,

he burned the license and went to cutting wood. That winter he helped cut two hundred cords of wood at twenty-five cents per cord. When he received his pay, there was included a bad two-dollar bill which represented four days' hard work. Mr. Hoard never failed to speak of the impression that this made on him regarding the need to the poor of sound money.

For the next three years he taught singing school in many towns from Waupun to the southern border of the state. He also gave instruction on the violin. He moved to Lake Mills, and there, on February 9, 1860, he married Agnes Elizabeth Bragg. In 1861 he enlisted in Company E, Fourth Wisconsin Volunteers, and was with General Butler at the capture of New Orleans. On account of ill health he had to leave the army in 1862 and went to his father's home in New York, but he again enlisted in 1864 in Battery A, New York Light Artillery, and served to the end of the war in 1865.

Immediately following the war, he went back to Wisconsin and settled at Columbus, where he went into the nursery and hop-growing business. He made some money in the nursery business, but lost it all and more, growing hops, and it took him twenty years to pay his debts. He started the *Jefferson County Union* at Lake Mills, March 17, 1870, and three years later moved it to Fort Atkinson.

In 1871 he organized the Jefferson County Dairymen's Association. Its success led to his organizing, in 1872, the Wisconsin State Dairymen's Association, of which he was the first secretary. This was among the first of its kind in the United States. He also helped organize the Northwestern Dairymen's Association of which he was later

William Dempster Hoard

president. In 1873 he helped organize the Watertown Dairy Board of Trade.

It was in these years of the early seventies, apparently, that he had his first vision of what dairying in the West might become. In 1870 the Wisconsin cheese product amounted to less than one million pounds, and this seemed an enormous amount to the people of those days. Then all cheese was sold on the basis of the Liverpool market, and the bulk of it, except the Wisconsin product, was shipped there. New York State and the Western Reserve in Ohio were the greatest cheese producing sections. Mr. Hoard thought if only the prohibitive freight rates to the Atlantic seaboard could be reduced, dairying would increase by leaps and bounds.

It was costing then two and one-half cents a pound to ship cheese in common cars to New York. Mr. Hoard made a trip to Chicago and interviewed the agents of all the different freight lines to the Atlantic coast, but when he told them what he wanted, they laughed at him. The last man he went to see was Mr. W. W. Chandler, agent of the Star Union Line, the first refrigerator line in the United States. When he went into the office, Mr. Chandler wheeled in his chair and said, "What do you want, sir?"

"I represent a million pounds of Wisconsin cheese seeking an outlet on the Atlantic seaboard at rates that will allow us to compete with other cheese-producing sections," replied Mr. Hoard. "I want you to make a rate of one cent a pound from Wisconsin to the Atlantic seaboard, in refrigerator cars, and I also want you to send a refrigerator car to Watertown, Wisconsin, at a meeting of our Dairy

Board next week, and come yourself to explain its advantages and workings."

"Is there anything else you want?" asked Mr. Chandler.

"Not now," was the reply.

The very audacity of the request seemed to gain its point, because Mr. Chandler said he would do it. This rate was in effect for many years and is practically the rate to-day. Cheese factories then began rapidly to increase in numbers and the cheese business continually improved, until J. Q. Emery, Dairy and Food Commissioner of Wisconsin, now estimates that Wisconsin cheese products for the year 1913 exceeded 190,000,000 pounds, and in the same year the estimate shows 133,000,000 pounds of butter, which together with condensed milk, market milk, cream, and by-products would exceed in value $100,000,000.

From the very first publication of the *Jefferson County Union*, which is to-day one of the best county papers in Wisconsin, he published one or two columns about the dairy, and he constantly urged the farmers of Jefferson County to go into the dairy business.

In 1885 his son, Arthur Hoard, suggested that he believed there was a field for a special dairy paper. His friend, Edward Coe of Whitewater, suggested the name *Hoard's Dairyman*, and the venture was undertaken. From the small, four-page paper of that day *Hoard's Dairyman* has now become the leading dairy paper of the world, with thirty to forty pages weekly and with a circulation of seventy-five thousand. It goes into every state in the Union and into practically all foreign countries. Sir Henry Lennard, who owns a famous dairy farm near London, sent word to Mr. Hoard that all he knew about the dairy busi-

ness he learned from *Hoard's Dairyman*. The same testimony has come from dairymen in Australia, New Zealand, and Japan. Doubtless the same is true of every other country in which the English language is read.

At a meeting of the Executive Committee of the Wisconsin Dairymen's Association held in Milwaukee in 1884,

The office and plant of the W. D. Hoard and Sons Company.

Mr. Hoard offered a resolution asking the legislature of the state of Wisconsin to provide some sort of system of farmers' institutes. Appropriation was made at the next session of the legislature, and this movement has spread practically to every state in the Union and has been one of the most powerful influences in agricultural education.

Probably W. D. Hoard is better known for his championship of the special-purpose dairy cow than for any other

one thing. To thousands of audiences in every state in the Union he has said: "You don't hunt chickens with a bulldog, and why will you insist in dairying with a beef cow?" In his study of the subject he prepared a series of charts to use at Farmers' Institutes and dairy conventions, the thought of the address being, "Temperament produces function, and function controls form."

Wishing to own some of the best dairy cattle for the purpose of study, he purchased, about 1885, pure-bred Guernsey and Jersey cows. In one of his addresses, he referred to his Jersey cow, Queen Felch, and his Guernsey cow, Bonnibel. At the same time he bought from Mr. Fairbanks the Guernsey bull, Nutwood, son of Materna, of World's Fair dairy fame, and afterward sold him back to Mr. Fairbanks.

In later years, when financial conditions permitted, he bought the beautiful farm just north of Fort Atkinson, now known as the Hoard's Dairyman Farm. Here he kept one of the best herds of Guernseys in the country. By his example on this farm, coupled with the teachings in the paper, he helped give a wonderful impetus to alfalfa culture.

The starting of the Farmers' Institutes and the real beginning of agricultural education at the University of Wisconsin in 1886 gave an impetus and inspiration to agriculture, and the farmer became a respected citizen in that state.

In March, 1888, there were three candidates in the field for the Republican nomination for Governor of Wisconsin: E. C. McFetridge, H. A. Taylor, and Colonel George Ginty. On the morning of March 26, 1888, when

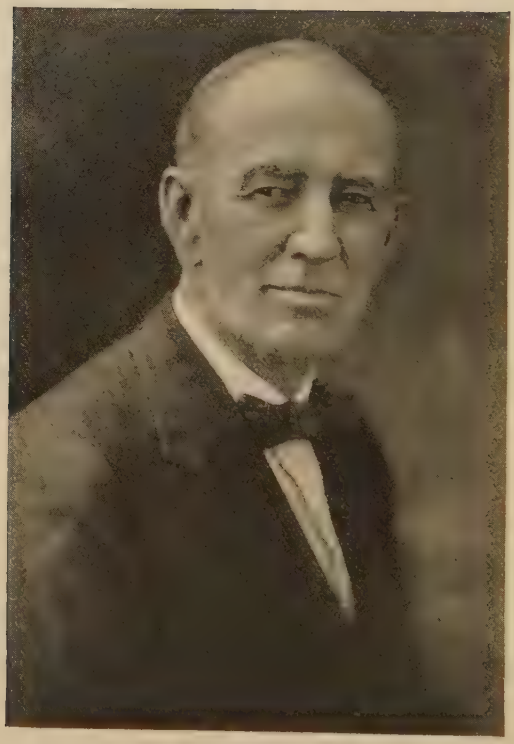
Mr. Hoard started down to the office, the first man he met said:

"Have you seen the *Sentinel* this morning, Mr. Hoard?" meaning the *Milwaukee Sentinel*. Mr. Hoard replied that he had not, and the man said, "Better look at it."

He was so accosted two or three times on the way down town, and when he reached the office he saw the paper. There was a long article, purporting to come from Madison, suggesting Mr. Hoard's name for Governor. It later became known that this was written in the *Sentinel* office by Horace Rublee, the editor. Mr. Hoard took the suggestion as a joke but at once began to get telegrams of congratulations, and his candidacy gained such headway that, when the convention was held in September, he was unanimously nominated on the first formal ballot. He was elected by a twenty-thousand plurality over James Morgan, Democratic nominee. During the session of legislature in 1889 there was passed a law compelling the teaching of English in all public and parochial schools, and not a single member of the legislature, either Republican or Democrat, voted against it. Within the next year, however, very strong opposition to the law arose on the part of those interested in the parochial schools, and, when the next convention was held, in the fall of 1890, the politicians urged Governor Hoard and others in charge to weaken on the Bennett Law, the name by which this law was generally known. Governor Hoard said he would never do it; that this law was right, and that if he were to be nominated for Governor, the party platform must declare in favor of the thought expressed in the Bennett Law. This was the year of the Harrison defeat, and with the influence of national politics,

combined with the opposition to the Bennett Law, Governor Hoard was defeated by George W. Peck by a twenty-seven-thousand plurality. This is but an illustration of Governor Hoard's attitude towards anything that he considered right, regardless of policy or of other people's opinion. After that time, he served his state as Chairman of the Board of Regents of the State University, as President of the Wisconsin Board of Commissioners for the Louisiana Purchase Exposition at St. Louis in 1904, and in many other capacities. During his term as Governor there was passed the law creating the Dairy and Food Commission, which was the first of its kind. He was the best known and most active worker for anti-oleo legislation. Any one talking to him soon discovered that there was no subject nearer his heart than that of seeing that the dairymen shall have the benefit of having oleo and other imitation dairy products sold for what they are.

The need of the world is vision. Here was a man who, returning to Wisconsin at the close of the Civil War, when the raising of wheat was the only kind of agriculture to which the farmers were paying attention, looked into the future and saw something of what dairying might do for the soil and the people. Doubtless then, as in every year after, some one told him, "The business will be overdone," but he took no heed. First, in his home county and through the local papers, he urged more and better dairying. Then, in a rapidly widening field of influence, he worked until all the world rose up to call him their benefactor and acknowledge their indebtedness to him.



W. S. Robbins

WILL S. ROBBINS

1854–

Will S. Robbins of Horace, Indiana, is known throughout America as one of the best producers of shorthorn cattle. The Robbinwood herd owned by the Robbins family is also familiar to the leading shorthorn men of Scotland and other cattle-producing countries. A recent visitor to Aberdeen, Scotland, was asked what other towns of importance were near Horace. The visitor replied, "Well, Horace is fifty miles from Indianapolis, Indiana, seven miles from Greensburg, Indiana, sixty miles from Cincinnati, Ohio, and seventy-five miles from Louisville, Kentucky."

It is interesting to note that Horace consists of a blacksmith shop, store, and railroad station, but the Robbins family with their wonderful shorthorn cattle have made the community famous in Canada, South America, Mexico, Scotland, and many other countries outside of the United States where good beef cattle are known and appreciated.

Will S. Robbins learned from his father, J. G. Robbins, how to produce excellent shorthorn cattle. He has with the assistance of his son, Earl E. Robbins, continued and greatly improved the work started by his father.

The foundation of the Robbinwood herd was laid in the year 1882. At this time there were selected three head of females from the herd of James Hall near Paris, Kentucky; three head of females from Ezra Swain & Son, Noblesville,

Indiana; and a pair of yearlings, one bull and one heifer, from Thomas Wilheit, Middletown, Indiana.

The cattle purchased from Mr. Hall were Verbena 10th, a young Mary; Cherry 14th of the Jessamine family; and Belle Morton 5th, a young Phillis. Cherry 14th and Verbena 10th each had a heifer calf at foot, and Belle Morton had a bull calf. For these three cows and calves Mr. Hall was paid two thousand dollars.

The purchases from Mr. Swain consisted of Kitty Wells 9th, (an Amelia), Frantic A of the Frantic family, and a two-year-old heifer named Haxa. Kitty Wells had at foot a roan bull calf by Lord Nonpareil which was named Luther Nonpareil. For this lot was paid fifteen hundred dollars.

The Wilheit purchase consisted of two yearlings, a young Mary bull, Athelstane 5th, and a Frantic heifer called Frantic C. The price for these was one thousand dollars.

The cattle purchased from Mr. Hall were very satisfactory breeders, Verbena 10th being the granddam of Gay Mary, the champion shorthorn cow shown by this firm at the World's Columbian Exposition in Chicago in 1893.

Of the Swain cattle only the bull calf Luther Nonpareil proved to be of any great value. He made a successful show and breeding bull and was chief stock bull until the purchase of Imperial Gay Monarch. Of the Wilheit pair the bull was barren, but the heifer was a very successful producer, and from her descended some extremely successful show cattle.

From this it may be seen that the herd from the beginning has had its share of reverses. Previous to the laying of this foundation there had been purchased from Kentucky dealers several head of cattle represented as shorthorns for which satisfactory pedigrees were never received, so after working

with them for a few years, they were discarded entirely. None of their produce could be recorded. The only value they had was to impress upon the founders of this herd the necessity of dealing with real breeders of good reputation rather than trying to buy bargains.

Being located in a general farming section and wishing to breed cattle filling the requirements of the country, the proprietors had for several years believed the shorthorn best adapted to the needs of the section in which their farm was located. J. G. Robbins, the father of Will S. Robbins, had been working along this line for several years with the idea of breeding better beef cattle but having had little or no regard for pedigree.

At the time this herd was founded, Bates breeding was most fashionable in shorthorn circles, but after visiting the leading Bates herds of Kentucky, (which at this time was considered the greatest nursery of shorthorn cattle in the United States) and then seeing some of the leading herds where Scotch blood was being used, the decision was made to use Scotch bulls.

Proof of the quality of stock that is being produced at Robbinwood farm is found in the fact that the shorthorn animals raised by the Robbins family have been distributed all over the United States, and quite a number have found their way into South America and Mexico.

The farm has passed through periods of depression as well as through times when the prices were good, yet it has never been put on a "boom" basis. The prices have followed the trend of the times, but conservative values have ruled, and buyers have always got value received in animals purchased. The high standard of the herd has been main-

tained by selection of the best animals to be bought from other herds in the United States and Canada, and the proprietor has also visited the good herds of Great Britain and made selections there.

Mr. Will Johnson of *The Shorthorn World*, December 25, 1923, wrote as follows: "For more than fifty years Robbinwood has been the home of many of America's greatest show and breeding cattle. The slogan, 'We breed our show cattle and show our breeding cattle,' so long used in connection with cattle from this farm, was exemplified in the many champions bred, fitted, and shown year after year by these great breeders. Every section of the United States had been benefited by the effects of their work.

"The firm was originally J. G. Robbins and Sons, W. S. Robbins being one of the sons. It is now W. S. Robbins and Son. Earl Robbins, the son in the firm name, is noted as one of America's master fitters and showmen. His children being reared upon the farm to-day are taking the same interest as their father, grandfather, and great-grandfather took, and in time will doubtless be just as much benefactors of the breed as their forebears.

"Many a great herd of the present day owes its foundation to cattle bred at Robbinwood. Never have the owners of this herd been known for the high prices they have received for cattle, but always they have been known for the high quality of the cattle they have bred and sold."

Mr. Will S. Robbins said to one of the authors, "I have often been asked the question, why I selected shorthorns when I decided to breed pure-bred cattle. In reply to that question I will say that I considered them the real farmer's cow; the one best adapted to the conditions under which we

were working at the time. The experience of my father had proved to me conclusively that pure-bred animals are better than grades, mainly for the reason that they reproduce themselves with greater certainty because of the pure-bred blood lines. We were farmers but wanted to manufacture the products of our farm into the best selling article possible and as the shorthorn was a combination cow, producing both beef and milk in the greatest amounts; and as there was a steady demand for both these products at the time, I thought it was the animal I wanted to breed. I have always lived on the farm, doing all kinds of work in connection with farm labor, and when the cattle began to develop, my interest naturally increased from merely a beef production standpoint to that of developing the best seed stock to sell to the farmers and breeders of the country. I learned to love my cattle and learned that kindness to them was one of the biggest factors in producing animals of the highest grade. Selection, care, and feeding have developed the shorthorns to what they are, and those who expect success in this business must not omit either of these factors. The tendency is to go the wrong way all the time, and that must be overcome by careful attention to the three things I have mentioned.

"Our farm is perhaps an average Indiana farm. We have never wasted money in buildings although our cattle are made comfortable, but we have never expended money for show. After getting to the place where we wanted to sell good cattle, it was necessary to secure publicity, and for this purpose as well as to gratify a certain sense of pride that we had in this business, we began showing at the county fairs. The success of this method of advertising was such as to cause us to branch out, each year getting a little

farther away from home during the show season until we reached the point where we could show at the state fairs. From the showyards we got our greatest inspiration as well as enjoyment, and we would advise any one engaging in the shorthorn business, to fit a few good cattle for the show and go to the fairs. While we have believed in judicious newspaper advertising, nothing has ever proved so successful a medium of publicity as the show ring. Besides this, there is always a very great degree of satisfaction in being able to beat the other fellow.

"We have always found that an infusion of fresh blood into the herd is necessary at times in order to improve the quality of our cattle, and for this reason we have sought the blood of the best herds of Great Britain as well as that of the best American herds in order to produce the best individuals. While I have never been a stickler for pedigree, believing that individual merit should come first, I also believe that the more good individual animals are contained in a pedigree, the surer they will be of constant reproduction of themselves.

"I have been through the period of inflated values, also the times of depression, but have carried on the shorthorn business the same as the other farming operations. Too many persons are anxious to engage in the business when prices are running high but just as anxious to get out of the business when prices are low. This has had but little effect on our breeding operations as we have always bred just as good cattle as possible, sold them at conservative prices with our guarantee back of them for future usefulness to the purchaser, but have very seldom been overstocked with cattle.

"We have customers who have bought their bulls from us continuously for twenty-five years, and that is the kind of

business we desire most. We have always been very careful not to advise buyers wrongly when they ask us to help them select animals from our herd. If a man wants to buy a bull from us to use on a pure-bred herd, we first ascertain the line of breeding he already has in his females as well as their individuality before advising him what selection to make. This often necessitates a visit to his herd, but we have learned that it is better to go to this expense in order to make sure that our customer gets what he should have. We realize more fully each year that, when selling an animal to an unknown breeder, we are placing our reputation in his hands to a certain extent and that our name will suffer if he makes a mistake. This is one point which cannot be too strongly impressed on the breeders of pure-bred cattle.

"The champion shorthorn cow of the leading shows of Great Britain in the year 1900 was Cicely, owned by Queen Victoria. The champion shorthorn cow of the American show yards that same year was Ruberta, which we were showing. Mr. W. D. Flatt of Canada purchased from the Queen of England the cow Cicely for the avowed purpose of defeating Ruberta. Mr. Flatt was one of my best friends, and we arranged for a series of five consecutive shows between the champions for the year 1901, but at the first show Ruberta defeated Cicely, and Mr. Flatt decided to sell her together with all of his show herd at Chicago, about sixty days after her defeat. At this sale we bought Cicely at public auction, paying five thousand dollars for her, which, at that time, was a record price for a cow for the past half century.

"Soon after this sale I was in Nashville, Tennessee, attending the shorthorn sale at that point. The weather

was extremely cold and stormy, and I came in from the sale barns about two o'clock in the afternoon. While I was in the wash room of the hotel a gentleman came in and we naturally began to talk about the weather. I said to him, 'This is mean, stormy weather we're having.' He replied,

The Lad For Me and Ruberta, sired by St. Valentine.

'Yes, I have been traveling out of this town for ten years and have never before seen anything like it here.' I said to him, 'Your live stock must suffer in this section as I see very little protection in the way of barns and stables, especially for cattle.' He replied that he knew nothing about cattle and very little about farm conditions in general or live-stock conditions in particular as that was entirely out of his line. I turned round to the towel to dry my hands

and he followed me saying, 'Speaking about live stock, I want to tell you something. I have a friend who travels out of Chicago and owns a farm in northern Indiana on which he has some shorthorn cattle. He told me that he was at a shorthorn sale in Chicago a short time ago where a man

Lad's Lady, sired by The Lad For Me, first at American Royal and International 1903, bred and owned at Robbinwood.

from Indiana by the name of Robbins bought a cow for five thousand dollars. Now don't you think a man would be a fool to pay that much money for a cow?' I said that it would surely seem as if he was a little bit lacking in the upper story to do a thing like that. He replied, 'I think he would be not only a little lacking but a fit subject for the insane asylum.' I turned my back to keep him from seeing

me smile. He came around in front of me and handed me his card. I returned the compliment by handing him ours. When he read it, he looked up at me, and the color came to his face. He looked down at the card again, then back at me, and burst out laughing, saying, 'Well, I guess you know who the fool is now.'

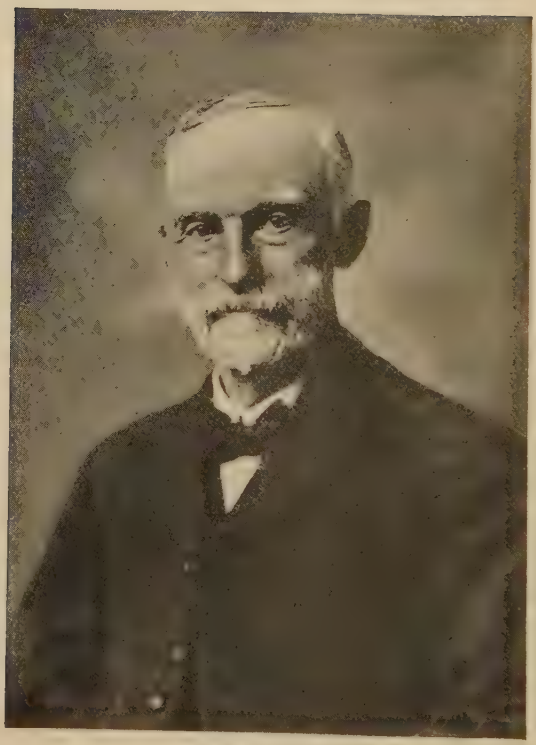
Merry Chimes. Winner of $1000 cup at American Royal Exposition in 1923 for best shorthorn bull in show. One of the stock animals now in use at Robbinwood.

"We stayed there three days, at the end of which time I went to settle my bill at the hotel. The clerk said to me, 'You don't owe us anything.' I asked, 'How is that? We have been here three days, my wife and I, have been rooming and eating with you. Do you run a charitable institution?' He laughed and replied, 'No, we are not doing that, but Mr. Johnson of the Dayton Cash Register Company, who lives

here, told me to charge your bill to his account whenever you were ready to leave, and that is what I am going to do.'

"This incident shows what something outside of the ordinary will do to attract the attention even of people who are not interested along similar lines. This gentleman was selling cash registers, knew nothing of the value of cattle, but he remembered the name of the person who bought the highest-priced cow which had been sold in many years.

"In conclusion," said Mr. Will S. Robbins, "I would say to any young man who desires to make farming his life work that he can not engage in anything more profitable nor from which he will get more real satisfaction than breeding shorthorn cattle. There is nothing I enjoy more than to get out among the cattle, especially when they are on grass, showing every evidence of contentment, and just watch them and wonder what the future will be. I can not imagine anything more interesting than watching the development of a calf from its birth, caring for it, weighing it at the end of the month, trying to see how much it has gained, until it has developed into a matured animal. This requires patience, which is one of the greatest elements of success in the shorthorn business. As for the profit, it will be the same as in other lines of farming; some years you will get good returns; other years will be lean ones, but if taken through a series of forty or fifty years, I think it is as safe a proposition as any a farmer can engage in. While I enjoy growing a good crop of corn, making a good pasture or a good meadow, and everything else that goes toward bettering the conditions of our farm in general, there is nothing which holds my interest as does the developing of the shorthorn cattle."



Amos Ives Root

AMOS IVES (A.I.) ROOT

1839–1923

One day in August, 1865, a young man of twenty-six stopped his work to watch a swarm of bees flying overhead. He began to ask questions concerning the habits of bees, so that his companion exclaimed, "What will you give me for them?"

"A dollar," was the response of the young man who never dreamed that the swarm could be called down.

However, within a short time the friend returned, bringing the bees in a rough box. He was given the dollar, and the bees' owner, Amos Ives Root, began to learn the rudiments of bee-keeping, a task he steadily pursued until his death. To-day he is remembered among bee-men as the wizard of bee-keeping, and as the man who, until his death, was the head of the largest bee-keepers' supply house in the world.

For several days after he had acquired his unusual pets, young Root delved among the books and papers at hand, trying to find out their habits, the methods of handling them, and the possibilities offered in the business of bee-keeping. He inquired among farmers in the neighborhood who had kept bees, hoping to secure advice and encouragement. But, although he learned that bee-keeping had once been considered profitable, the general opinion seemed to be that when a country was no longer new, bee-keeping didn't pay. Fortunately, Mr. Root had the idea that it would pay and tenaciously held to his idea.

A few days later, he went to Cleveland on business, where he hastened to a bookseller's to see what he might find on the keeping of bees. A lucky chance threw Langstroth's *On the Honey-Bee* into his hands and from then on, "Father Langstroth," as he is fondly known by the past generation of bee-keepers, was the favorite author in Mr. Root's library. He felt like a modern Robinson Crusoe discovering a new country, a land of Amazons, ruled over by a queen-mother, a realm rich with the proverbial honey. He made an observatory hive for his swarm and raised queens from worker eggs although it was late in the season. Furthermore, he bought a queen from Mr. Langstroth for $20.00, thereby arousing doubts in the minds of his neighbors as to his wisdom and even his sanity. The enthusiastic amateur would probably have fulfilled their dire predictions, if a plain, practical farmer near by had not come to the rescue. With his help and the purchase of more bees, the colony was safely wintered.

In 1865, a Venetian, Major Francesco de Hruschka, had made the happy invention of an extractor, a machine for throwing out honey from the combs by centrifugal action. News of this came to American bee-keepers in 1867 from Germany. Mr. Root fashioned a simple, homemade machine, using the principle of the Continental machine, and that year took 1000 pounds of honey from twenty stocks. All his previous critics changed their minds concerning his sanity, but many reverted to their original comments when two thirds of the colonies were winterkilled that year. Nothing daunted, Mr. Root increased the size of his apiary from eleven to forty-eight colonies in the following season, succeeded in wintering them all, and secured

6162 pounds of extracted honey, which brought him in $1500.

All the doubting Thomases were convinced, and, more than that, inquiries began to pour in from all sides. Mr. Root answered many of them through the *American Bee Journal*, but even that couldn't take care of all. Then he began to issue circulars giving information in clear, simple language as to bees and their life, methods of bee-keeping, and the production of honey as a business. Finally these circulars expanded themselves into a magazine called *Gleanings in Bee Culture*, which is still published by the A. I. Root Company. This has met the demand for information since 1873 and is known far and wide. Besides this, Mr. Root and his colleagues compiled a brief encyclopedia called *The A B C and X Y Z of Bee Culture*, which in its several editions since 1877 has become the bee-keeper's Bible.

Another interesting development of the inquiries sent to Mr. Root resulted from the fact that many people could not make, or did not care to make, the necessary apparatus. And there was no one to whom to refer such inquiries. He had made his own hives in part of his little jewelry store before he gave up that business for professional bee-keeping. He found that the hives then in use were not adapted for use with an extractor; the machines, too, were heavy and poorly made. So, the bee-keeper turned manufacturer. He made his first hives with a cut-off buzz saw run by a windmill. These were an improvement upon those already in use, and his business grew so rapidly that in 1878 he purchased the Medina County Fair Grounds containing twenty-two acres and began building for his increased

business. One brick block after another was added to take care of the demands. Now the A. I. Root company is the largest bee-supply house in the world. Any one wishing to start an apiary can secure anything he needs, from the veil for his face to the containers for his honey.

In 1883, Mr. Root's ill health made him drop the subject of bee culture and take up gardening. He made a success of this side line, too. Because his gardening was continually crowded out in his Medina home by the inroads of the factory, he transferred his gardening interests to Florida where he spent each winter. Although eighty years of age, he retained his interest in his publications, in his enormous bee business, and in his gardens. In this way he could see the actual results of his labors, for many of our best fruit men have said that the bee wizard has benefited the world by the valuable contribution of the bee in fertilizing the flowers of agricultural plants, of ornamental flowers and shrubs, thereby increasing the amount of pleasure of mankind and augmenting the food supply of the world.

Surely an occupation which fascinated a man like Mr. Root all his life must be an unusual one. He felt that it was. Perhaps better than any one else, he realized the romance of the bee, its usefulness to mankind, and the importance of its product throughout history. It might be well to give a few of his ideas as incorporated in the words of W. P. Root, employee of the A. I. Root Company in an article on "Honey — Its Use and Production."

"The earliest records in human history show that honey was used as an article of food by the ancients in Babylonia, Syria, and Egypt, and especially by the Greeks and

Romans. The Jews used it not only for food but largely in their religious ceremonies. It is often spoken of in the Old Testament, in connection with milk, as one of the attractive features of the promised land — a land 'flowing with milk and honey.' Samson found some honey in the carcass of a lion and was refreshed as he ate it. Jonathan, when famished after the battle, found some and ate it, although his father had forbidden it under pain of death. The record adds that the youth was refreshed. Honey was eaten by Jesus after His Resurrection, and John refers to it in his Revelation. Honey is always spoken of in the Bible as a blessing, and has been esteemed highly wherever used. This is because of its concentrated food value, furnishing as it does an invert sugar which can be used safely by persons who can not use common sugar.

"There is an old adage to the effect that

God made bees, and bees make honey.

"This is not true except in the sense that a cow makes milk. Honey is floral nectar elaborated in the honey-sac of the bee. But what is nectar? When clover blooms, pull a head and pluck off one of the small tubes and squeeze it slowly between the thumb and a finger, beginning at the top. Ordinarily a minute globule will be seen oozing out of the tube at its base, resembling a minute diamond. This is clover nectar, and its sweet taste will be very perceptible, small as the amount is. If on any of the clovers, except the red, the common honeybee alights, it sucks up this nectar and stores it in its honey-sac till it has about a drop. Then it flies to its hive and regurgitates this nectar (now honey) into a cell in the comb. During a flow of

nectar there is a constant stream of bees making their deposits in the 'First National Bank of Melita,' for instance, and often in an incredibly short space of time a comb about nine by seventeen inches is crammed full of honey on both sides, every cell being capped over with a film of wax when full.

"Right here I wish to speak of the source and flavors of nectar, although only a few of these nectar-yielding plants can be named here out of thousands.

"In New York the great honey crop is from buckwheat, thousands of acres of which are sown. Its yield is generally great, but the honey is rather dark and strong, and yet it is preferred to all others by the people where it is raised. Honey from basswood is also a large crop in New York. Probably basswoods yield more nectar than any other tree or plant. Just before a thunderstorm in July, its nectar often actually drips on the ground like syrup. Sometimes, however, it may yield nothing.

"In Florida the palmettos and oranges are the main sources of honey, which they yield in enormous quantities. In the semi-arid regions of the West, as in Colorado, Utah, New Mexico, and Arizona, the great sources of nectar are alfalfa, sage, and the mints. These yield astonishing amounts of honey which has a delightful aromatic or minty flavor and odor.

"Sweet clover, till lately a dreaded weed, but now known to be a wonderful acquisition to our agricultural wealth, yields honey of a fine quality and for weeks at a time. It constitutes a large part of all the honey produced in some states. California, the leading state in honey, has such a variety of honey plants that enumeration is impos-

sible. The extent of our country is so great that its wealth of honey flora cannot be estimated. So numerous, indeed, are honey plants that hardly a place can be found where bee-keeping cannot be made a profitable investment.

"The gathering of nectar by the bees causes them to accomplish the main object of their creation. This is not to secure honey but to fertilize fruit blossoms by carrying pollen from blossom to blossom, thus fertilizing the pistils of the flower - that is the female organs. Where bees are near fruit, and the weather is not too wet, this busy work on the blossoms of apples, cherries, etc. causes a loud and pleasant hum. Without this work the fruit is light in yield and of bad shape and small size. In view of this, it is pure stupidity to spray the blossoms at this time, as the poison kills the bees and neutralizes the vitalizing influence of the pollen — the male element. Besides, at this time the larvæ of the moths and other enemies are not sufficiently developed to be injured by the spray. Fruit growers are slowly learning this lesson.

"If the reader will examine the edge of a piece of honeycomb, he will see that the cells have one common base between them, the two contiguous cells sloping downward slightly as to hold the nectar better. Imagine the cells removed, except the base, and one will have a thin film of wax stamped with the corners of cubes, about five to the inch. These corners form a hexagon just like the open end of the cell. This invariable hexagonal form of cells avoids all loss of space, and of no other form can we say that so far as bees are concerned. By fastening a sheet of this favored wax (now called foundation) in the frame, just as a picture is kept in a frame, it saves the bees just

as much labor and material as it would a man if he were to start the erection of a house and found that some kind fairy had made the cellar during the night and laid all the foundation ready for the carpenters. The bees immediately draw out the cells and begin to fill them, thus being enabled to increase their output greatly. . . . It enables man to determine and limit the number of drones raised; for by making the bases of the cells larger, a larger cell is produced, which is necessary for drones. Formerly bees would raise a lot of idle drones to consume their stores when a few would suffice; and out of that number only one can be of service in the fertilization of the one queen in the colony. The queen mates but once in her lifetime. When honey ceases to come in, the bees expel the drones, when they perish. The bees do not kill them. In case of the death of the queen the worker bees feed what is called royal jelly to a larva of what would otherwise be an ordinary bee like themselves. These workers are all undeveloped females. Queens are raised in cells quite different in appearance from the others, as they are nearly as large as a peanut. She develops from the egg in about twenty-one days, mates when ten days old, and immediately begins her sole duty — that of laying eggs. She can do this advantageously for two seasons, but many bee-keepers renew their queens every year to insure strength. The workers die off rapidly when a few weeks old, in the working season; but after that the survivors can live over winter and part of another season. Every attempt is now made to have the bees winter successfully instead of killing them with brimstone, as was once the wasteful and wicked practice.

"The duration of bee life is easily ascertained by chang-

ing a black queen to a yellow Italian. The blacks rapidly disappear, and the golden beauties take their place.

"Instinct impels the bees to swarm at least once. As the old home becomes crowded, the bees send out scouts to find a new home. If not prevented, they will elope with the old queen, leaving a queen cell to hatch out a new queen for the colony left behind. Thus their existence is preserved. But the careful bee-keeper will have another hive ready with sweet-smelling sheets of foundation inside of it. The swarm is dumped in front of this hive, and in most cases a new colony is immediately formed.

"These large frames alluded to are designed mainly for what is called 'extracted honey.' They are fastened in a reel inside of a large tin can, and whirled around rapidly by means of gear-work, when the liquid honey will fly out like water from a wet sponge when whirled around rapidly by the arm. The honey is then drawn out through a faucet and canned or bottled. The amount thus secured annually in the United States is measured only by the carload and trainload. This honey is all absolutely clean, as in a modern hive the queen is not allowed to go where the honey is stored. She simply has to stay downstairs and lay eggs.

"Comb honey for the market is stored by the bees in square boxes or frames, about four inches by four inches, the size varying slightly. As seen in the grocery, these sections of honey may all be depended on as being genuine and perfectly free from foreign matter. Comb honey can not be counterfeited, and extracted is seldom or never adulterated, as detection is easy and costly.

"The amount of extracted honey bought and bottled

by the A. I. Root Company at Medina would seem to a stranger to exceed by far the total output of the world. Huge vats containing the liquid sweets are filled, the honey being warmed till it is about as hot as the hand can endure. A higher temperature would spoil it.

"The amazing increase in the amount of honey produced now as compared with 1860 is due to the invention of movable frames which were brought before the world by L. L. Langstroth, and comb foundation.

"But the discovery of a thing is not enough. Who shall make it of practical use to man? Just as Mr. Langstroth had brought his frame into a place where it would stay, he introduced into this country the Italian bee, to which I have made necessary reference. The superiority of this strain over our old black bee became at once so apparent that it has now virtually displaced all others and has really made a new era in bee culture."

F. LOTHROP AMES

1876–1921

The Langwater Farms, North Easton, Massachusetts, have created a new Guernsey Family, superior in every respect to the best animals imported from the Isle of Guernsey.

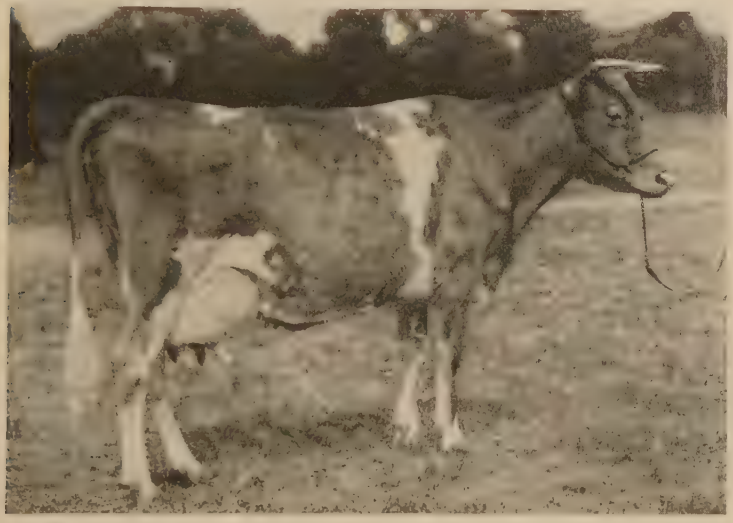
F. Lothrop Ames, the late owner, had large wealth, and besides that he had the cattle instinct, the gift of constructive breeding which is as distinct an art as that of the painter, poet, or orator. Only the true lover of his art has great success, and F. Lothrop Ames had love for the art of breeding as intense as that of a violinist or opera singer for his art.

In 1900 Mr. Ames made his first purchase of rare Guernseys for Langwater Farms. In 1916 he sold at public auction at fabulous prices the best adult animals, and the popular impression was that Langwater Farms had practically "sold out." But Mr. Ames knew that he had retained young Guernseys that would in four years give him a better herd than he was then selling.

In two years, in 1918, twenty-one animals sired by Langwater sires averaged $2201. In 1919, twenty-nine animals sired by Langwater sires averaged $3215. In 1920, nine animals sired by Langwater sires averaged $4075. In three years, 1918–1920, seventy-four head sold for $215,580, an average of $2913.

F. Lothrop Ames

Line-breeding of Guernseys was unknown in England, on the Isle of Guernsey, and in America. Inbreeding was universal. Line-breeding of Guernseys was as great a revelation, as great a revolution or evolution, as was the introduction of the Babcock Test for butter-fat. Line breeding makes an art out of the science of live-stock breeding.



Langwater Cleopatra 47043A.R. Sold for $19,500. 11,488.80 lb. milk, 614.17 lb. fat, Class G; 15,364.70 lb. milk, 792.51 lb. fat, Class B. Sire Imp. King of the May; Dam Imp. Capelles Rose, 12,376.80 lb. milk, 617.97 lb. fat; Langwater Cleopatra is the dam of Langwater Queen of the East which sold for $11,000, and of Langwater Eastern King, which sold for $9200.

When Mr. Ames began breeding Guernseys in 1900, there was no approved type. The genius of Mr. Ames was in seeing that the Guernseys in England, on the Island, and in the United States had never been adequately developed. They simply had larger size and a hardier constitu-

tion than the Jersey; beyond that they had slight value. To see the possibilities in Guernsey was real genius. To develop other characteristics that should rival the Jersey's prerogatives was Mr. Ames' masterliness. Mr. Ames created a Family in the breed that attained fame in the production

Langwater Warrior. This is one of the best animals that was ever owned at the Langwater Farms.

of milk and butter-fat, almost literally creating a new breed of dairy cattle.

In 1900 Mr. Ames imported four Guernsey cows, four yearling heifers, and a bull calf. None of these made a really important contribution to the fame of Langwater Farms.

In 1901 Mr. Ames secured Dolly Bloom, the first animal to give fame and fortune to Langwater Farms. She was purchased as a bred yearling for $175. Among the de-

scendants of Dolly Bloom have been Ne Plus Ultra, Stars and Stripes, Stephen Dairy's May King, Jethro Boss, and Langwater Steadfast.

In 1902 Mr. Ames authorized Edmund Burnett to buy for him in England the four best cows obtainable, the investment not to exceed $10,000. From these importations of twelve females have come most of the Rose Family that has made Langwater world-famous.

Langwater Dairymaid sold for $6150, and Langwater Africander sold for $8600.

Ne Plus Ultra was sold for $1500 to the H. McK. Twombly farm and his descendants have brought more than a quarter of a million dollars.

Mr. Ames sold May King to Mr. Dupee for $1800 and the purchaser sold him for $20,000 to Mr. Herd.

Langwater Cleopatra and Langwater Warrior are two of the best animals that cattle lovers have ever seen on the Langwater Farms.

F. Lothrop Ames is from an eminent New England family. The Ameses were the first to manufacture on a large scale farm hand implements, shovels, hoes, and rakes. The Ames Shovel Works have been the foundation of the family's wealth.

Mr. F. Lothrop Ames made good use of his wealth. He demonstrated that the good can be made better. His demonstration teaches the world not to be satisfied with the ordinary. Such an individual with constructive ideas and a desire to build can certainly be called a true benefactor. Mr. Ames was born July 23, 1876 and died June 19, 1921.

LEADERS OF RURAL ECONOMICS
AND SOCIAL LIFE

JAMES R. HOWARD

1873–

James R. Howard has been the executive head of the youngest and the largest of the national farmers' organizations, the American Farm Bureau Federation. He lives at "Homeland," a 488-acre farm near Clemons, Iowa. Great trees, elms and maples, surround the fine farm house that he inherited from his father and modernized with his own hands. Great crops of corn are grown on the Howard farm. Every year James R. Howard raises and feeds from two to three hundred spring pigs. He raises cattle too; the cattle markets know him, and he knows them. He sells from two to six carloads of fat steers each year. He keeps a band of ewes and contributes a carload of fat lambs to the world's mutton supply. Much manure is provided by the live stock to go back onto the fields which respond with an average of about seventy bushels of corn per acre in his "corn — corn — oats — clover" rotation.

James R. Howard was born on the land, of fine Quaker stock. His grandfather, whose name he bears, was one of the first settlers of Marshall County, Iowa, and in 1861 built the house in which his grandson lives to-day. The lad grew up on the farm and had all the rich experiences to which the American farm boy is heir. After completing his high-school course, he attended Grinnell and Penn Colleges in Iowa. From Penn he holds a Master of Arts degree. His college career was finished at the University of

Chicago, from which he received the degree of Bachelor of Philosophy.

After finishing his college course, Mr. Howard taught school for a time. Then he began farming for himself at home in Marshall County, Iowa. For a time, he was cashier of the New Providence State Bank. When about thirty-five years of age he attracted the attention of the Iowa State College authorities by the success of his farming operations. He converted the old place into one of the best farms in central Iowa. He planned and built a large barn which the Iowa Extension Department called the best general-purpose barn in the state. He rebuilt the old farm house, equipping it with electric lights and waterworks. He did the plumbing with his own hands.

Mr. Howard's vision extended far beyond his own fence rows. He was one of the organizers of the Clemons Coöperative Company. He led the movement which brought to his community, Iowa's first consolidated school. When the Marshall County Farm Bureau was organized, he was elected its first president. When the Iowa Farm Bureau Federation was organized, he was elected its first president. When the American Farm Bureau Federation was organized, he was elected its first president. Gradually, naturally, as a tribute to his brain-power, to his tact, and to his essential fairness of attitude toward the farmer and the public, great and increasing power has been tendered him.

Readers interested to learn something about the American Farm Bureau should read Revised *Leaflet No. 1*, an official publication of the Bureau, which says in part:

"The American Farm Bureau Federation is a league of the Farm Bureaus of the nation in which the common

James R. Howard

interests of all county organizations are united for the advancement of agriculture in the United States of America, economically, educationally, and socially, on a constructive basis."

The American Farm Bureau Federation was organized March 4, 1920, in Chicago. Twenty-eight State Farm Bureau Federations were represented at the organization meeting.

The American Farm Bureau Federation is directed and controlled by farmers through a Board of Directors consisting of one official and one additional representative from each state for each 20,000 members or major portion thereof, and by an Executive Committee consisting of three members of the Board of Directors from each of the four regional districts of the United States. All of the officers and directors must be actually engaged in farming.

The American Farm Bureau Federation is purely representative, for:

1. It represents the states which have been admitted into the national federation. The total membership at present in the states is more than 1,000,000 — the largest body of organized farmers in America.

2. It represents more than 1600 County Farm Bureaus, each of which has an official board of farmers.

3. It represents all communities. Each County Farm Bureau organization provides for a director from each community or township, a coöperator from each school district, and a well-distributed membership.

4. It represents all agricultural interests. The members, officers, and directors of the various County Farm Bureaus include individuals engaged in all of the general and special-

ized lines of farming, and all are united for the advancement of agriculture, economically, educationally, and socially.

5. It represents the various agricultural associations. The Farm Bureaus do not aim to replace any other organization but include among their membership representatives of all farmers' organizations. The Federation encourages community organization and coöperation.

The American Farm Bureau Federation is not a political organization. It believes that the safeguarding and promotion of agricultural interests are vital to the public welfare, and that these interests can best be protected by the united action of all, regardless of factional or political differences.

The American Farm Bureau Federation is not a panacea or a cure-all. It depends for its strength upon the kind of support given to it by the local, county, and state organizations, and the coöperation which it receives from the various agencies interested in the welfare of agriculture.

The American Farm Bureau Federation speaks the true voice of its membership. The referendum is used to obtain the viewpoint of its membership upon all great public questions.

The American Farm Bureau Federation is free from political entanglements. Whenever any officer or director becomes a candidate for state or national office, he must immediately resign his office in the American Farm Bureau Federation.

The American Farm Bureau Federation, the State Farm Bureau Federations, and the various County Farm Bureaus represent only a nominal investment on the part of any one individual. The entire upkeep of the County Farm

Bureaus and the State Federations in the American Farm Bureau Federation, uniformly apportioned, costs the farmer less than one cent an acre on his land. This includes federal, state, and county appropriations and membership fees. One half to two thirds of the finances necessary to support the County Agent movement comes from public funds appropriated to maintain the Agricultural Extension work carried on thorugh Farm Bureaus, but no public funds go to the support of the State .or American Farm Bureau Federations. The American Farm Bureau Federation depends for its support entirely upon the funds from the individual Farm Bureau membership fees, of which it receives a sum not to exceed fifty cents per member. The farmer has been taught by the County Farm Bureau the great advantages which come to him through organization. He demands that his interests be effectively represented at the council tables of the nation, and he is willing to make proper financial provision for such representation.

In its program the American Farm Bureau Federation seeks to develop a completely unified national organization to represent and act as spokesman for the farmer on all occasions where his interests are involved. Its program of work is entirely constructive in nature and wholly free from prejudice of any kind.

Some of the important departments included in the American Farm Bureau Federation are: Organization, Legislative, Coöperative Marketing, Transportation, Economics and Statistics, Finance, Education and Publicity.

The foundation of the American Farm Bureau Federation is its Organization Department. At the first annual meeting in March, 1920, there were twenty-eight states

affiliated in the Federation. At the time of the second annual meeting in December, 1920, there were thirty-seven states affiliated, and the secretary's report to the officers at the Atlanta, Georgia, or third annual, meeting showed that there were forty-six states affiliated. This department is available to states desiring assistance in the building or strengthening of the State Federation through County Farm Bureau membership drives.

The Legislative Department of the American Farm Bureau Federation is located at Washington, D. C. Its functions are to safeguard the rights and interests of the farmer and to assert his needs whenever occasion requires. In 1921 it aimed to establish, without question, the legality of collective bargaining; to secure farmer representation on all boards and commissions appointed by Congress or the President; to defend the farmers' viewpoint on questions relating to tax, tariff, currency, banking, railways, highways, foreign markets, merchant marine, territorial acquisitions, and strengthening the Federal Farm Loan Act; to secure the establishment of a system of personal credits for farmers; and to demand regulation and supervision by the Government of all commercial interests whose size and kind of business enables them to establish a monopoly dangerous to the best interests of the nation.

The Department of Coöperative Marketing was created especially for the purpose of developing a perfected national scheme of marketing farm products, so as to reduce the margin between the producer's and consumer's price. This department works in close touch with the Farmers' Grain Marketing Committee of Seventeen, the Farmers' Live Stock Marketing Committee of Fifteen, and such other

marketing committees as may be appointed by the President of the American Farm Bureau Federation for the purpose of investigating the distribution of various farm commodities, and of working out improved systems of marketing. The establishment of local coöperative enterprises which can obtain assistance and representation through the Farm Bureau is one of the functions of this department. It will work to unite these various local coöperative enterprises on a national marketing program for the benefit of both producer and consumer through improved distributing agencies.

The Department of Transportation was organized to help improve to the greatest possible extent the service of the railroads, to prevent excessive transportation burdens on farm products, to investigate tendencies in rates and regulations affecting agricultural products, to secure an advantageous allocation of cars, etc. In the advanced rate case of 1920, the Director of the Transportation Department represented the interests of the farmers and shippers so effectively that the reductions in freight rates over the original proposal of the railroads is saving the farmers over one hundred million dollars, and the general public several times this amount.

The principal function of the Bureau of Economics and Statistics is a careful study of agricultural statistics, improved cost-accounting methods for farmers, crop statistics and forecasts, price and credit analyses, crop conditions, weather conditions, tendencies in tariff, merchant marine, internal revenue, ocean freight, costs of production, etc. This is the farmers' own Bureau. It will not duplicate any work otherwise done by State or Federal agencies.

The question of taxation has been given special study. The National Industrial Conference Board asked the American Farm Bureau Federation to appoint a representative to sit with it and to aid in making exhaustive research and recommendations. This representative was able to convince the Board that no steps must be taken to transfer tax burdens from powerful and wealthy individuals to those less able to pay. A special committee of the Federation was able to secure new and favorable rulings regarding farmers' income tax reports and a new farmers' account book was approved by the United States Treasury Department.

The Department of Finance had in its charge the details of financing the work of the American Farm Bureau Federation. This requires close contact with the member states. All financial records, receipts, and expenditures are handled by this department.

The Department of Education and Publicity seeks to keep the general public sympathetically informed as to the ideas and accomplishments of organized agriculture. It is also a service department to all the other departments of the Federation and to the executive head. It maintains a weekly news letter for farm papers, issues special bulletins to dairy papers and press associations, prepares feature stories for farm publications and other magazines or syndicates, and prints and distributes pamphlets and speeches. It uses every means at its disposal, working through the State Federations, to create in every farm bureau member an intense consciousness of the responsibilities and privileges of his membership and to create in the urban mind a better conception of the farmer's relationship to other units in the social and economic structure.

In 1900, Mr. Howard married Anna Pickerell, a high-school teacher. Three stalwart boys and a young daughter comprise their family. Recently when addressing the Illinois Agricultural Association, Mr. Howard said that he would be bitterly disappointed if any one of his boys should decide to be anything but a farmer.

No one who has seen James R. Howard doubts that he belongs to the modern school of real farmers. He stands full six feet and is lean and fit. He carries not a pound of superfluous weight, yet tips the scales at 197. The grip of his handshake, the light in his eye, his smile, and physiognomy are revealing. In him, the organized farmers of America find a leader worthy of their calling and their cause.

WILLIAM SAUNDERS

1822–1900

One of the first men of his period in America to stimulate an interest among farmers in improving rural social conditions was William Saunders. He was known as a nurseryman and horticulturist as well as an architectural landscape gardener and for his work in starting the great national farmers' organization called the Grange.

William Saunders was born at St. Andrews, Scotland in 1822. In February, 1848, in "Old Church," Hammersmith, near London, he was married and started on his honeymoon trip in a sailing vessel for New York. He became an American citizen in 1857.

The first important work that Mr. Saunders did in the new world was the laying out of Clifton Park, an estate of some four hundred acres belonging to Johns Hopkins, the founder of the university bearing his name. His greatest work, considered by many people the greatest piece of architectural landscape work in America, is the western terrace of the National Capitol. Architects consider it the finest of its kind in the whole world. Notwithstanding the fact that the dome has three rows of pillars, while its model, the Pantheon at Rome, has but two, the enormous length of the Capitol as originally planned was quite disproportionate to its height, but this is not apparent since the retaining walls planned by Mr. Saunders have been built. They more than double the apparent height. It was Senator

Morrill of Vermont who appreciated the genius of William Saunders and secured the necessary appropriations.

Examples of Mr. Saunders' landscape work are seen in parks at Baltimore, Maryland; and in Fairmont and Hunting Parks, Philadelphia, Pennsylvania; also in cemeteries at Amboy and Rahway, New Jersey; in Rosehill, Chicago, Oak Ridge, Evanston, and Springfield, Illinois; and in Bethlehem, Pennsylvania; as well as in many other smaller parks. Conspicuous among monument grounds are the Gettysburg Cemetery and the Lincoln Memorial at Springfield, Illinois. The latter work was done with the coöperation of General Grant, then President of the United States.

Lincoln appointed William Saunders landscape architect for the Gettysburg Cemetery, and through his sense of justice the grounds were divided so fairly that every State was satisfied. He devoted a great deal of time and expended a considerable sum from his personal funds in carrying out his plans, yet all he received from this great work was a vote of thanks. He was always so busy doing real work that he never had time to collect the pay.

Another important item, which should not be overlooked, in Mr. Saunders' landscape work, was the planting of three hundred thousand trees while he was chairman of the tree-planting committee of the District of Columbia. This made the National Capital a city in a real forest, as it were. No one can estimate what the city of Washington owes him for the improvements in the surroundings of its schools.

As long ago as 1855, in a contribution to the *American Farmer*, Mr. Saunders outlined an organization such as the Grange afterwards became. This was probably the first endorsement of coöperation printed in America. This idea

William Saunders

when further developed resulted in the Grange, organized in 1867 at 4½ Street and Missouri Avenue, in Washington, D. C.

William Saunders, known as Father of the National Grange, was the writer of the preamble and constitution and was Master of the Grange for the first six years. More

The office of William Saunders, Washington, D. C., the birthplace of the order of "Patrons of Husbandry," where the National Grange was organized, December 4, 1867.

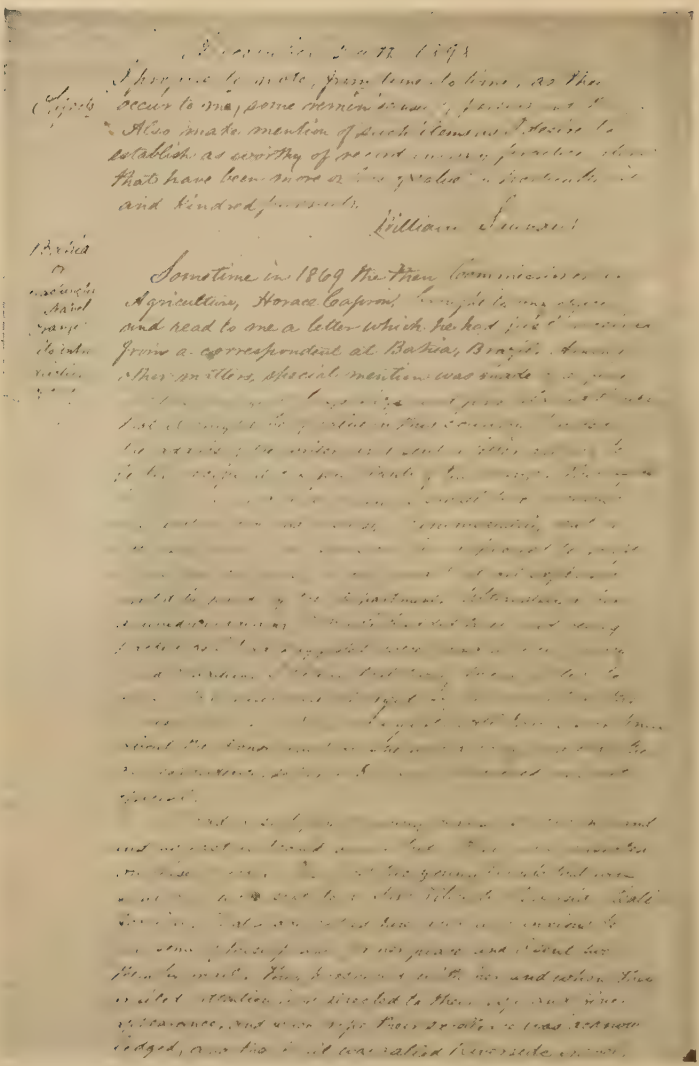
than fifty years has been required to work out Mr. Saunders' ideas. At the present time coöperation, "co-op," and pool are commonplace, yet these principles were new and untried when they were embraced in the constitution of the Grange. He secured adequate representation for women in the Grange and the offices carried names that prevented any man from holding them, viz: Ceres, Flora, and Pomona, showing that, as regards justice to women, he was half a century ahead of the world.

To his clear perceptions, his extensive literary and scientific culture, and his sturdy common sense, the Grange owes those features which have made it so acceptable to all who have investigated its history and principles. His deliberate and sound judgment, his wisdom and faithfulness in council, his thorough devotion to the interests of the Order, his remarkable foresight in comprehending its possibilities in the future, and his unimpeachable integrity, won for him the confidence of the Patrons of Husbandry all over the country.

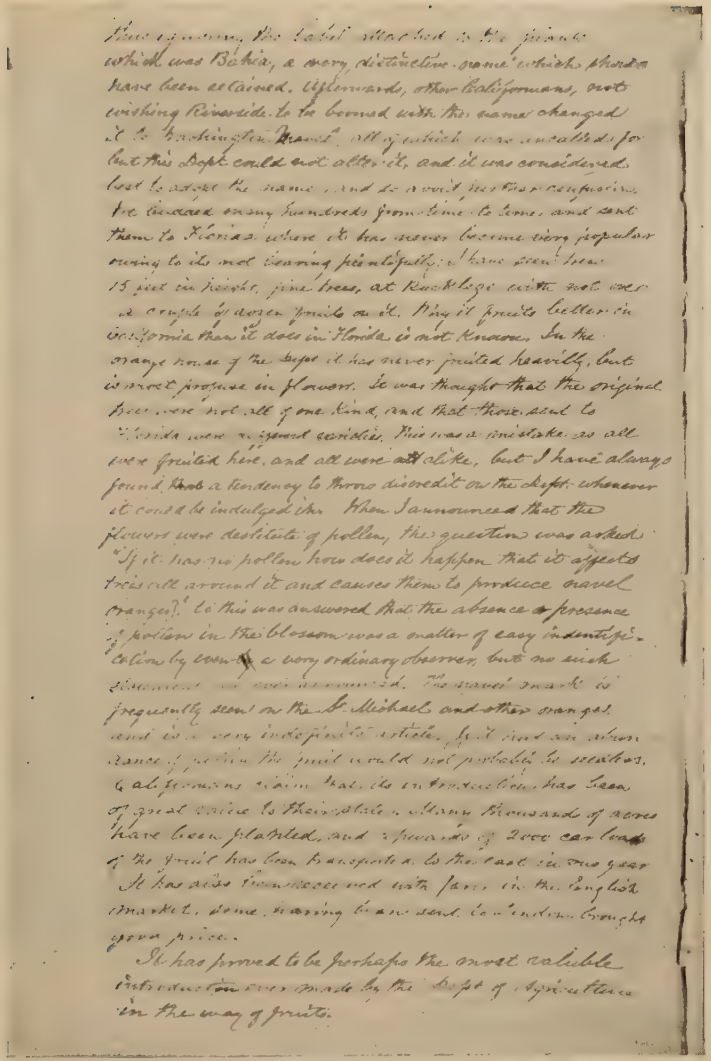
Among the many things of economic importance introduced into this country by Mr. Saunders was the Bahia or Washington Navel seedless orange. In his journal appears an account of its history. The millions that this orange has made for American agriculture, more than the cost of maintaining the United States Department of Agriculture from the beginning, have long been spoken of. Doubtless we would be quite right in speaking of it now as a matter of billions.

William Saunders entered the service of the United States Government in 1862 and from that time was located in Washington, D. C., where he was closely indentified with the work of adorning that city.

The grounds of the Department of Agriculture were designed and planted by him and serve to illustrate the success with which landscape gardening and scientific classification had been combined in laying out these grounds, embracing an arboretum comprising a collection of all hardy trees and shrubs arranged in their natural order. These grounds during Mr. Saunders' lifetime were considered the most attractive in this country.



Letter written by William Saunders.



Letter written by William Saunders. — (*Continued*)

Courtesy U. S. Dept of Agriculture.

Picture of the mother tree of the seedless orange.

Mr. Saunders served faithfully for thirty-eight years, constantly trying to improve the usefulness of the Department. It would be impossible to enumerate here every one of the economic plants now growing in the United States for whose introduction he was responsible. Among other things he introduced "fixed roofs" on greenhouses, which, besides giving the plants more light, have resulted in a saving to the gardeners of this country of hundreds of thousands of dollars.

As a hobby, some forty years ago, Mr. Saunders took up the breeding of the beautiful amaryllis. He worked at this for many years in a small private greenhouse in his own yard and created many new and beautiful varieties, four of which he named for his granddaughters, "Flora," "Beulah," "Violet," and "Mabel." When he grew older and the care of the greenhouse became a burden, he gave the entire collection, at that time the largest in the country, to the United States Department of Agriculture.

In 1874 Mr. Saunders was appointed to represent the Department of Agriculture in connection with its exhibit at the Centennial Exposition at Philadelphia. He served on the building committee and selected the site of the building, besides designing and executing all the plans for the Government grounds. He was awarded the magnificent medal "for services" by the United States Centennial Commission.

He also represented the Department at the Exposition at New Orleans, Louisiana. Here he received a medal for a collection of native woods that he had on exhibition, showing their various uses. The Department was represented by him at the Exposition at Louisville, Kentucky, and he was

actively connected with the Department's exhibit prepared for the Exposition at Paris in 1889. He personally contributed to this exhibit a plan of the Department grounds to illustrate landscape gardening and scientific classification. This was so much appreciated by the jury of awards as to secure for him a gold medal.

All his life Mr. Saunders was a frequent and capable contributor of articles on horticulture, landscape gardening, and agricultural subjects to the leading periodicals of the day, and it is a conservative estimate to say that the number of papers submitted would aggregate more than three thousand.

The great ambition of William Saunders as a boy was to bring the world to see that the work of a horticulturist was as important as that of a botanist and should rank with the learned professions. This has long since come to pass. His ambition as a man was to secure for agriculturists a rank equal to that of doctors, lawyers, teachers, and preachers. This, too, has in a great measure been realized.

No one could with truth call Mr. Saunders a "canny" Scotchman, for frankness and open and above board methods were his strongest characteristics. One of his strong tendencies was his extreme punctuality. In 1860 Mr. Saunders was keeping five civil engineers and some hundreds of laborers at work. In order to keep all engagements, he travelled that year twenty-nine thousand miles, riding at night as much as possible in order to save time for work. It was while making one of these long tours that a gentleman called at his home on important business. Mr. Saunders had been gone ten days, and the gentleman asked when he would return. His wife replied with a downward inflection, indi-

cating that she knew, "At seven o'clock." The gentleman, opening his watch, said, "It is now ten minutes to seven." "Well," said Mrs. Saunders, looking out of the window, "there he comes across the lawn." He was a man who ran on schedule time and kept his appointments with precision. His career was in itself a living exemplification of the motto of his family, "He who tholes conquers."

G. Harold Powell

G. HAROLD POWELL

1872–1922

The problem of decay was uppermost in the minds of California citrus growers up to the year 1901. Before a carload of oranges reached the Atlantic seaboard, a quarter of them might be spoiled, though they had been loaded in apparently perfect condition. Direct losses ran into millions of dollars annually, and the poor-keeping quality hurt prices and consumption.

So serious did the problem become that in 1904 the Government decided to dispatch an expert fruit man to the scene. The Department of Agriculture had successfully studied the keeping quality of apples and peaches. It was reasoned that the man who had triumphed over apple scald and the decay of so perishable a fruit as the peach should be able to decrease the loss on California oranges. Hence the same investigator was sent to the coast.

The government representative took off his coat and went to work in the groves to discover what was wrong. A comparatively short investigation convinced him that here, in another form, was his old enemy of the apple and peach industries — decay due to injuries inflicted on the fruit during picking and packing. There were diseases, it is true. But the diseases attacked the fruit through clipper cuts, fingernail cuts, thorn punctures, bruises, and skin abrasions caused by gravels, splinters, and nails.

"Eliminate the cuts and bruises, and the rot and mold

are shut out," reasoned the investigator, and he set about to do it by first proving to everyone's satisfaction that careless handling was the real difficulty and then by inaugurating better methods. This man was G. Harold Powell, general manager of the California Fruit Growers' Exchange.

Mr. Powell, scientist though he was, saw in citrus decay a human and not a pathological problem and he tackled it in a human way, at the human end. It was his practical viewpoint and genius for organization that conquered the mold and fungus.

And there perhaps is the key to his success as manager of a coöperative organization which is conceded to be the most successful association of producers in the country. His job was to look ahead, to lay out a program, and to get things done. A scientific mind, trained to search out the hidden roots of a situation, a practical viewpoint, and the ability to organize — these are the qualifications which made the Exchange manager a great leader.

G. Harold Powell had a good background and training for his work. He was born at Ghent, New York, on February 8, 1872, and grew up on the farm of his father, George T. Powell, a prominent New York State apple grower and a well-known investigator and writer on fruit subjects. In 1891, after graduating from the Union Free High School at Chatham, New York, young Powell went to Cornell and began an agricultural course, working under Liberty H. Bailey. While in college he added to his bank account by running a boarding house.

After being graduated with the degree of bachelor of science, he returned to Cornell in 1896, when he secured a fellowship and a master's degree. That same year he

added a partner to his career in the person of a wife, Miss Gertrude E. Clark, and took up his duties as horticulturist and entomologist at the Delaware Experiment Station where for five years he worked on commercial and scientific horticultural questions until 1901 when he was taken into the Department of Agriculture at Washington.

His first work was on an apple problem. Mr. Powell's years in his father's orchard and his ten years at Cornell and Delaware had equipped him admirably for the work. There was difficulty about the storing of barrel apples. They were damaged by scald and decay in cold storage. The growers blamed the storage men, the storage men blamed the growers, and the courts had little data by which to fix responsibilities. Mr. Powell found three main causes of damage: First, varieties of apples susceptible to scald were too immature when picked. Second, all apples were held out of storage too long after picking, starting decay. Third, storage was at too high temperatures.

This was the first investigation of the keeping qualities of a farm product ever made by the Government and it carried the agricultural scientists into a new field. Up to that time the scientist had centered all his energy on increasing and improving production and considered his work ended when the crop had been harvested. When it was shown that methods of harvesting had direct bearing on keeping quality, the scientists were started toward a field of investigation which has wonderfully broadened their usefulness in the past ten years.

In all this work his success lay in his application of scientific knowledge to the industry problems of transportation and cold storage. After completing his apple work, he was

sent to Georgia to see how his results could be applied to the better handling of peaches in transportation. It was found that good transportation called for cooling before shipment, so the first pre-cooling system was devised to chill fruit in the cars after loading. After having been in California several years investigating problems of decay in citrus fruits which we have mentioned, he went to Italy in 1909 to study the lemon industry.

After the orange investigation, Mr. Powell was recalled to Washington, where during 1910 he was assistant chief of the Bureau of Plant Industry, and also acting chief in the absence of Dr. Galloway. He encouraged investigations along similar lines with grain, cotton and other food products. A long list of Government bulletins on fruit transportation and storage records this work. But California thought so well of him, and he had developed such a love for California that in 1911 he returned as manager of the Citrus Protective League. For the League he made his second trip to study at first hand the citrus industry of Italy and also to study the industry in Spain.

Then in 1912, Mr. Powell accepted the post of manager of the California Fruit Growers' Exchange for which his twenty-one years of training had so admirably fitted him and where all his powers of organization were brought into full play.

"My greatest interest in agricultural problems has always been the business and economic side," Mr. Powell had often said. The position of manager of the Exchange was therefore much to his liking.

His long experience with the fruit industries of the country and his intimate acquaintance with the citrus indus-

try of California had given him an unusual opportunity for observing what was needed. As manager of the growers' organization he set about to carry out some of his ideas.

The growth of the Exchange during the first nine years of his leadership was remarkable. In that period membership in the organization had grown from a representation of fifty-nine per cent of the industry to seventy-three per cent with a present membership of 10,500 growers. Since 1909, when the Exchange handled 22,954 carloads of citrus fruits for its members, systematic effort to develop the market has made it possible to market an output of 50,000 carloads, and the organization in June 1921 did an annual business for its members of more than $60,000,000.

The efficiency with which the organization is managed is indicated by the fact that the total cost of the Exchange service including advertising and all other forms of selling amounts to only 9.13 cents per box of oranges and 12.63 cents per box of lemons, an average of 2.01 per cent of the delivered value of the products. This is the lowest known cost for marketing any perishable food product in America.

The men who worked with and under Mr. Powell appreciated especially his great fairness and the fact that he was always willing to give credit where credit was due. His workers regarded him more as a colleague than a boss. He was preëminently an organizer and an executive of the most efficient type. He had the quality of judging men, necessary to a successful executive, and he knew when and to whom to give authority. Such authority, once delegated, was then upheld. He had a faculty of getting rid of details and thus relieving his mind for the consideration of the more important questions. Matters that came under the

jurisdiction of any particular department were always taken up by him with the head of that department. In this way, he delegated responsibility and got results.

Mr. Powell took the broadest possible view of coöperation. To him it meant much more than good packing and marketing or the economical purchase of supplies. He looked upon it as the very foundation of a healthy country life. When growers work together to spray and fumigate trees, to protect themselves against frost, to establish packing houses, to increase consumption of fruit by advertising, and to reap other direct benefits through coöperation, they make their groves pay, fill the countryside with comfortable homes, and work together skillfully for better government, better roads, and better schools.

The strength of the Exchange, he said, is not in the officers and directors, nor in its selling organization, nor in the handling of seventy-three per cent of California's citrus fruits, nor in the millions of money handled yearly but is back in the country among the individual growers. If the growers have advanced as each step has been taken and have confidence in the general policies because they themselves have helped to make them, they will be loyal to their organization in bad times as well as good.

His conception of the place he expected the California Fruit Growers Exchange to occupy is indicated by expressions found in some of his writings from which the following "fundamentals" are quoted:

"Unless a producers' organization confers a benefit on the public at large, as well as upon the industry which it represents, its future as a vital part of the social and industrial fabric of the country is problematical. . . . "

"There should be no antagonism between the producer, the distributing agencies, and the consumer. These distributors, or middlemen, are necessary both to producers and to the public because it is impractical and uneconomical to sell any large share of our farm crops direct from producer to consumer."

"A coöperative association is one in which the members form an agency through which they conduct their own business for their greatest mutual advantage. To be coöperative, it must be formed of producers exclusively and managed by them, and the benefits must be returned to them in proportion to the patronage of each."

"A coöperative organization, if it is to be permanently successful, must grow out of economic necessity."

"All directors' meetings should be open to the members, who must be kept posted on the business details and status of the industry. Frankness should be the watchword of the management, and exact justice, a square deal, and equality of treatment and of opportunity . . . should be the attitude in all relations with the members."

"Since a coöperative association is an operating industrial democracy in which the members trust each other as men, it should preferably be founded on equality of membership — whether the members' contribution of business or of capital be large or small — because neither the capital nor the volume of business contributed is the infallible measure of a man's fairness and judgment."

"No form of contract will hold the membership together indefinitely unless the benefits of the organization justify its continuance."

"The severest test put upon the manager will probably

be that of holding the organization to its primary purposes and he must be fearless of criticism in maintaining this policy."

"The questions which affect the stability and permanently successful development of the fruit industry can only be worked out by the producers coöperatively. They will not be solved by any one else because no one but the producer has a primary, vital interest in production. They can not be solved by an individual producer."

Mr. Powell had equal regard for the great and the small landowner, and he believed the citrus grower with a small acreage should have an equal power with the large grower in determining the policies of the Exchange. He considered this the basis of all true coöperation. "The basis of the coöperative organization is men," reads one of Mr. Powell's bulletins. "Capital can not coöperate; products can not coöperate; only men can coöperate."

He may be described as a scientific business man who put the industry's business problems under the microscope. He was insistent that the quality of Exchange fruit be maintained or improved, and he steadily developed the Field Department to handle this work. On the other hand he pursued a farsighted policy in strengthening the sales organization and enlarging the advertising program to care for present and future crops. The research laboratory for ferreting out new citrus by-products, the industrial relations department for handling employment questions, the survey of foreign market possibilities and the water transportation bureau were among his additions to the Exchange service under his management.

Perhaps Mr. Powell's greatest value, and the one which

was least recognized, was his close contact with national affairs. His years of service at Washington taught him where to go for help and how to get it.

He was a delightful host and companion. He was a lover of nature and all that is beautiful and his home at South Pasadena was conspicuous chiefly for its large and beautiful gardens.

One of his hobbies — and, characteristic of the man, it is a useful one — was collecting oriental rugs and antique furniture of rare pattern. There was not a room in his home which did not bear witness to his appreciation of the best in these furnishings. Rare etchings and beautiful paintings reflected his love of artistic things.

Fishing is a diversion in which he found not only good sport but relaxation from the responsibilities of his office. He believed that a fresh mind and sound body are essential to good work and that time taken to keep fit is time well spent. Most of his book reading was done between five A. M. and breakfast.

Wherever Mr. Powell was in charge, there was found harmony and teamwork. Twice weekly he held meetings with his department heads to discuss questions of general policy, interdepartment relationship and current problems. This conference and committee idea, developed throughout the Exchange, was characteristic of his skill in promoting harmony and welding work and people together. He knew how to use his men and to bring to bear upon every important question the combined judgment of those best qualified to consider it.

He gave a good deal of attention to the selection of employees. He believed in carefully choosing young men

who showed promise of development and then promoting them through the ranks as they showed that they could shoulder responsibility. He almost never brought a man in at the top. For most important posts he had a second man being groomed for the position, and he was never caught napping when he lost one of his principal associates. Men who might have been buried in other organizations of equal size seemed to develop rapidly under this man. Some of the leading men in the Exchange started as inspectors or stenographers.

When Herbert Hoover began organizing the United States Food Administration and was searching for able associates to handle various phases of his tremendous undertaking, he wanted Harold Powell to head the division of perishable foods. Though they knew that the citrus industry would miss him, especially in those troubled days, the directors of the Exchange consented to loan the services of their manager to the country and on July 9, 1917, he returned to Washington to be associated with the great food chief for a year and a half. He quickly gathered about him the best minds in each branch of the perishable food industry and within a short time had laid down a set of policies and regulations for the perishable food industry that were followed with marked success until the end of the war. In this work his division accomplished the end in view, the conservation of perishable foods and the control of trade practice with singular success and with marked approval of the trade, and at the end of the war the perishable food industries were returned to a peace footing without dislocation. In fact, it has often been remarked that the fruit and vegetable trade was never in sounder condition, so far as trade

practices were concerned, than at the close of the great war.

Mr. Powell finished his work for the Food Administration and returned to California in January, 1919. His contact with the country's biggest business men and with national and world-wide food problems and his association with Herbert Hoover returned him to the helm of the Exchange with new experiences and viewpoints that were of great value to the organization of which he was the head.

One of Mr. Powell's treasured possessions was the Cross of the Chevalier of the Order of the Crown, given him by King Albert of Belgium for work in the relief of that country.

His career brought him many honors, and many responsibilities. He was one of the two vice presidents of the American Association of Refrigeration and a director representing the individual membership of that organization. He was claimed as a member by various scientific organizations such as the Pomological Society, the Society for Horticultural Science, and the Washington Botanical Society. His name was also prominent in commercial organizations. He was a member of the Committee of Domestic Distribution of the Chamber of Commerce of the United States, which is making a study of the distribution of American food products from producer to consumer. He was a director of the Los Angeles Chamber of Commerce and chairman of its agricultural committee. When the State Market Director of California appointed a Transportation Committee to consider the effect of the railroad situation on California agriculture, Mr. Powell was named as chairman. On the executive committee of the State Agricultural Legislative Committee he represented the citrus industry,

and on the Los Angeles Board of the Foreign Finance Corporation he represented the state's agricultural industries. He was a member of the Los Angeles Athletic and Sunset Clubs and the Kappa Sigma and Sigma Xi (Cornell 1896) fraternities. He was himself a grower with an interest in a considerable acreage of oranges and lemons.

As a writer, his Government bulletins, his articles on the citrus industry and on coöperative marketing rank as authoritative. He published one book, *Coöperation in Agriculture*, and wrote a number of scientific bulletins and reports on the various investigations he carried out, notable among these being a bulletin first published in 1914 and revised in 1920 by the University of California College of Agriculture, entitled *Fundamental Principles of Coöperation in Agriculture*, which no less a figure than Bernard M. Baruch commended to the attention of business men.

Three sons were born to Mr. and Mrs. Powell, Harold Clark Powell, George Townsend Powell, and Lawrence Chase Powell.

G. Harold Powell had the right to wear a cross of honor that a king gave him, but he had a possession that was even more precious than that, the priceless respect, gratitude and confidence of thousands of California citrus growers. He died at Pasadena, February 18, 1922.

WILMER ATKINSON
1840–1920

Wilmer Atkinson, the founder of the *Farm Journal*, which now has over 1,000,000 circulation, was born of Quaker ancestry in Warwick Township, Bucks County, Pennsylvania. He was the third child of Thomas and Hannah Quinby Atkinson and was descended from a line of ancestors on his father's side extending back to William Atkinson of Scotforth, Lancashire, England, and on his mother's side to William Quinby of Farnham, of the County of Surrey, England, both of which families emigrated to America prior to 1700. The Atkinsons were among the earliest settlers of Bucks County, Pennsylvania, while the Quinbys were of the earliest of the Massachusetts settlers, having emigrated to this country not very many years after the arrival of the Mayflower.

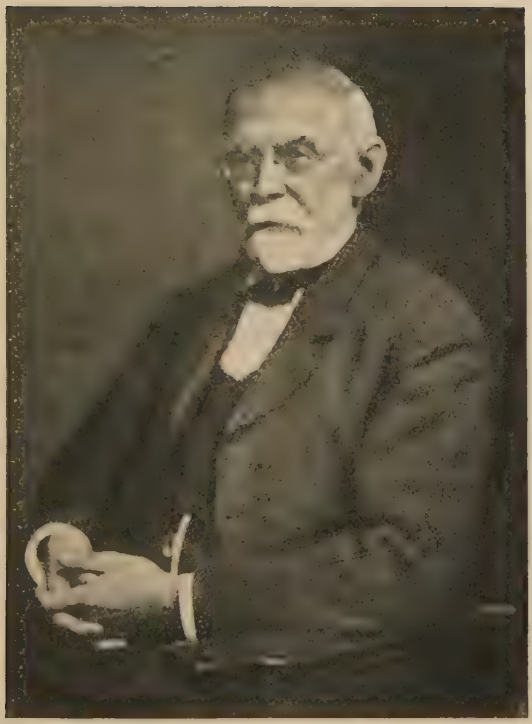
Wilmer Atkinson left an unfinished autobiography which has since been completed by his family. This shows him to have possessed a spirit of indomitable will and ceaseless energy. It is not uncommon for persons when speaking of successful men and women to attribute their success to "luck," but it is much more apt to be, as in the present instance, the result of indefatigable and painstaking labor with a determination to conquer all difficulties, come what may — briefly, to "carry the message to Garcia." This spirit actuated the whole life of Wilmer Atkinson up to its close. Even though he had had a happy childhood on a farm,

which is always a great asset, though he was blessed with parents whose honesty and integrity of purpose were alone an inspiration to high endeavor, and though he had a keen sense of humor, inherited from his mother, which helped him at all times to see the funny side of a difficult situation, a characteristic of great value, yet his success in life was largely the result of his own individual and persistent efforts.

He showed early in his youth a fondness for books, and, when missing from the home circle, could usually be found at the village library poring over ponderous tomes of history, biography, and what not. His early education was obtained at the village school, followed later by one year at Foulke's Boarding School (Gwynedd, Pa.) and another at Freeland Seminary (Collegeville, Pa.), now Ursinus College.

Through all of these early years he was getting from life not only a great deal of innocent fun, if one may judge from the merry jests and happy experiences that fill the pages of his *Autobiography* at this formative period of his life, but he was also laying a rich foundation for the responsibilities which he was so soon to assume. After graduating from Freeland Seminary, he was engaged alternately in teaching and farming, but, finding neither of these occupations congenial to his taste, he sought a larger field. Borrowing five hundred dollars from his father he set out in the world at the age of twenty-two to make his fortune.

It was in the late summer of 1862 that he, with a friend, Howard M. Jenkins (who was to become his brother-in-law and the father of Charles F. Jenkins, President of the Wilmer Atkinson Co.), bought the Norristown (Pa.) *Republican*, a weekly paper, which they continued to publish until 1864. Hardly had the young men established themselves in their



Wilmer Atkinson

new enterprise when they were called upon to take arms for the defense of their country. Three times Mr. Atkinson laid down his pen for the sword, the third and last time serving with the rank of 2nd Lieutenant. When at last the war was over, a satisfactory offer having been made to him to sell out his interest in the *Republican*, he accepted it and thus ended his first venture into journalism.

Shortly after this, in October 1866, he, together with his former partner, established the first daily paper in the State of Delaware — the *Wilmington Daily Commercial.* For over ten years they continued to publish this paper, in season and out, with all the vicissitudes which attend the production of a daily city paper. Each new difficulty was met with high courage and fortitude until finally there appeared in competition another daily paper – the *Every Evening.* This made it hard indeed, for not only was there created the natural competition resulting from the publication of two papers where there had been but one before, but their competitors were able, because of generous financial backing, to publish their paper at one cent per copy which was half the price asked for the *Wilmington Daily Commercial.*

For five years longer the publishers struggled to hold their own against these unfavorable conditions, at the end of which time Wilmer Atkinson withdrew from the field and founded the *Farm Journal.*

In 1866, shortly after he had entered upon his journalistic career in Wilmington, he married Anna Allen, daughter of Samuel Allen, one-time Sheriff of Philadelphia. Three daughters were born to them.

To quote from his *Autobiography* at the time he was about to engage in the publication of the *Farm Journal*, he

says: "I now often wonder why I was not a bit discouraged and ready to yield to what appeared to be a hard fate. I had a wife and three daughters to support. I was without capital worth speaking of and was near the age of forty. Yet if I was not rich, my health was good, my experience was a valuable asset, my family and myself rejoiced in the regard of hundreds of friends we had made in Delaware, I had the love of a true and helpful wife, the affection of our children, each one the pattern of her mother — why should I feel discouraged, why should I hesitate, why should I not go forward and make my boyhood's dreams come true? I was not discouraged; I did not hesitate; and I proceeded to carry out my design of establishing a monthly paper for farmers. For a person with a stout heart, a clear head, an honest purpose, a good wife and three daughters, there is no such word as Fail."

Thus he launched forth upon his third journalistic career. It was quite natural that his thought should have been led along agricultural lines. His ancestors, for generations on both sides of the house, had been farmers, so, whereas his work up to this period had been largely with the pen rather than with the ploughshare, it was because of his inheritance and early environment that he felt the call to enter agricultural journalism and to try to help the farmer to solve his problems, which he understood so well. His interest in their welfare was genuine and his desire that they should, at all times "have seats at the first table" was most sincere.

The first issue of the *Farm Journal* (March 1877), of which there were 25,000 copies printed, appeared in the latter part of the preceding month and perhaps it may not come amiss again to quote from his *Autobiography*. "The

Farm Journal when it first appeared late in February, 1877, did not greatly excite the populace. There was no general scramble for a copy. The Statehouse bell was not rung. I read the issue with interest and reread it several times over."

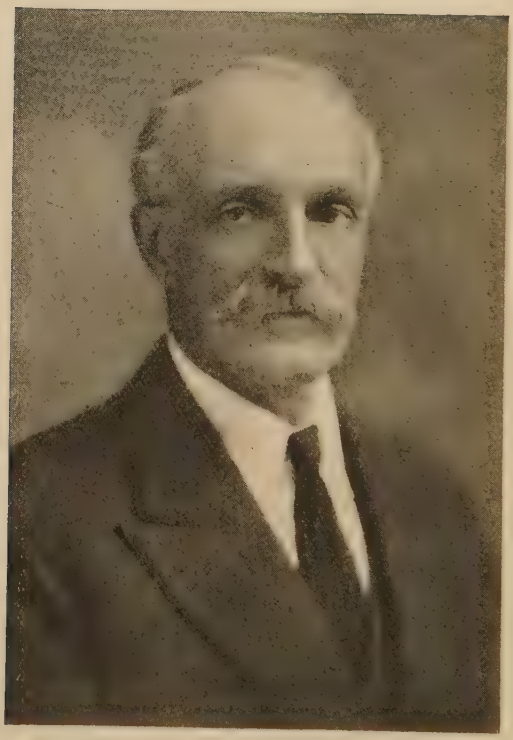
For forty years he continued its editorship, retiring in March, 1917, as editor emeritus. Beginning in a small way, during which time he was editor, publisher, advertising, subscription, and business manager, all in one, he lived to see the paper become the largest agricultural monthly in the world, with a circulation widespread throughout the United States. From a paper of eight pages in 1877 it had grown in 1920 to one hundred and seventy-two pages. In 1883, his nephew, Charles F. Jenkins, came to assist him in his labors, and much of the subsequent success of the *Farm Journal* may be attributed to his genius, wonderful executive ability, and capacity for hard work together with the abilities of Arthur H. Jenkins and A. Sidney Jenkins, brother and son, respectively, of Charles, all of whom have since become members of the Wilmer Atkinson Co.

It would be impossible to recount in this biographical sketch the various steps and methods by which the *Farm Journal* advanced year by year to the pinnacle of its success, but its progress was steady and sure because it was founded on sound business principles and because it was "Unlike Any Other Paper" — a slogan which has become a byword wherever the *Farm Journal* circulates.

In addition to his work on the *Farm Journal* he also edited for five years, beginning in 1910, *Poor Richard's Almanac*, which, fashioned after the manner of the original almanac of that name, had a circulation which at times approximated 100,000 copies.

While Wilmer Atkinson was preëminently a writer and publisher, his interests and activities were by no means confined to these fields of endeavor.

By nature and training he was a reformer in the best sense of that word, for wherever he heard the call of struggling humanity, there he could be found giving freely of his time, his sympathy, his advice and his money. He was actively interested during different periods of his life in anti-slavery, the temperance question, woman suffrage, the negro problem, postal reform laws, good roads, the protection of birds, and other reform movements too numerous to mention. But always, whatever the task of the moment, it was undertaken with an enthusiasm and thoroughness which spread its contagion among all who had the privilege of sharing his labors.



GIFFORD PINCHOT

GIFFORD PINCHOT

1865–

Some of the most fascinating pieces of literature that we Americans have had, deal with the pioneer days of our country. We are engrossed in the tales of adventure, live with our heroes their thrilling experiences, feel the excitement of their dangerous exploits, and draw with them a sigh of relief when the dangers are safely passed. Then we close our book with a feeling that it is a time long past, that the day of the pioneer, like the day of miracles, has vanished. Yet there are pioneers to-day, men who blaze the trail. When a man points out the way toward conservation and protection of Nature's sublime forests, when he battles for the monarchs of the woods like a frontiersman facing the foes of the wild, when he displays utter courage in the face of all obstacles, he may be justly called a pioneer. Such a man is Gifford Pinchot, expert in forestry, and governor of Pennsylvania.

Mr. Pinchot's training would not seem to be a training for a woodsman, according to the standards then in force. He was an Easterner, born in Simsbury, Connecticut, and was educated at Phillips Exeter Academy and at Yale where he was graduated in 1889. Feeling the necessity for experience in forestry, he went abroad to study in France, Germany, Switzerland, and Austria, where they had been forced to realize the need of conservation, as Americans had never done, and had developed the science of forestry to a

high degree of efficiency. Returning to this country, he inaugurated the first experiment in practical forest management on a large scale, in the United States, at Biltmore, North Carolina, on the estate of George W. Vanderbilt. This has since been purchased by the United States and is now the Pisgah National Forest.

In December, 1894, Mr. Pinchot opened his office as a consulting forester. Two years later he was appointed by the National Academy of Sciences as a member of a committee to report upon a plan for a forest policy for the United States. As the only forester in that body he outlined the policy which he was later to administer as head of the United States Forest Service. However, the report of the committee, while alive to the need of protection of forests, ignored in large measure the need to have them more fully used and enjoyed by the people. Mr. Pinchot made a minority report which laid strong emphasis upon the prime importance of encouraging the fullest legitimate use of the National Forests by the public. He further maintained that the only sound public forest policy was one under which use and protection went hand in hand. This minority report helped greatly to awaken the first general recognition of the public need for National Forests, and of the necessity for their protection and development, and for the extension of their areas.

One of the results from the work of this committee was the enactment of legislation in June, 1897, which defined the purposes for which forest preserves should be created, and provided for their administration. Accordingly, the next year, Gifford Pinchot was appointed Chief of the Division of Forestry in the Department of Agriculture.

This Division afterwards became the United States Forest Service.

Under Mr. Pinchot's administration the Forest Service

1. Introduced practical forestry among private timberland owners.

2. Produced more than 300 publications, of which more than 11,000,000 copies have been distributed.

3. Brought about the foundation of a forestry school at Yale University to which Mr. Pinchot and his family donated $150,000.

4. Planned the forest policy of the islands after a tour of inspection by Mr. Pinchot.

5. Forced the introduction of forestry on Indian lands under government control.

6. Secured an increase in the area of National Forests in the period between 1898 and 1910, from forty million to almost two hundred million acres.

7. Produced among the American people a general understanding of the importance of forestry for the first time.

8. Organized the protection, use, and reproduction of the National Forests, selected and trained their personnel, advised and secured popular acceptance of an entirely new system of handling the lumbering, grazing, and all other uses of the National Forests over an area larger than all the Atlantic states from Maine to North Carolina, inclusive.

9. Developed an efficient body of workers for the U. S. Forest Service.

Besides working toward an efficient national policy, Mr. Pinchot has been a leader in state and private forestry. Without the rapid advancement in national forestry under his guidance, the advancement in state and private forestry

would have been impossible. As head of the National Forest Service, Mr. Pinchot early turned his attention to coöperating with the states and private owners of timber land in order to stimulate a greater interest in state and private forestry, to help the states form effective forest organizations, and to induce private owners to begin the practice of forestry on their own lands. Time and again he has appeared before state legislatures on behalf of state forestry. In the Adirondacks, at Biltmore, and elsewhere, where working plans were outlined for private owners under his direction, the greatest advance in private forestry has been made.

When Gifford Pinchot first took up the task of encouraging state and private forestry, Minnesota and Pennsylvania were practically the only states who gave any attention to the protection and conservation of their forests. To-day at least twenty-five states have active forest departments; fourteen states have established state forests totalling about four million acres; and forest taxation has, during the last seven years been put upon a more equitable basis.

Some of the most bitter struggles of our economic history have been fought over the question of ranges in the West. When Mr. Pinchot took charge of the forest service, there were no restrictions on grazing cattle and sheep on the public domain. The big man was able to crowd off the small settler; restricted and excessive grazing had worn out the pasture in many localities. Each spring there was a rush for the grazing grounds, and fatal shooting affairs between rival stockmen fighting for possession of the range often resulted. Mr. Pinchot spent many months in the West, often out of doors in the saddle and by the campfire, getting the views of the stockmen before he made any step toward regulation.

Then he announced that the grazing lands within the National Forests would be conserved, and in 1906, against the protests of a majority of the stockmen, a system of grazing regulations was put into effect. These limited the areas to be grazed each year and the number of head per acre. Sheep ranges were separated from cattle ranges. The interests of the small man with only a few head of cattle or sheep were guarded and protected, and the herds of the big stock owners were cut down for the benefit of the little men. These restrictions stopped the range wars, and materially increased the carrying capacity of the range. To-day at least ninety per cent of the stockmen indorse the system of regulations put into effect in the National Forest ranges.

Another notable type of service for which the United States owes much to Gifford Pinchot is the reclamation of what was considered waste land. In 1901, in conjunction with F. H. Newell, who afterwards became head of the United States Reclamation Service, he drew up plans for the national irrigation of the arid lands of the West. They discussed the matter with the President, and, at his request, prepared material on this subject for a message to Congress (December 3, 1901) which laid the foundation for a national policy of irrigation and forestry. Seven months later the Reclamation Act was passed. Under it such great engineering work as the Arrowrock, Pathfinder, Roosevelt, and Elephant Butte dams have been constructed. It has turned millions of acres of arid lands into prosperous homes and has added hundreds of millions of dollars to the wealth of the nation.

Still another field in which Mr. Pinchot has made a distinct contribution is that of public lands. He originated the plan of a Commission on Public Lands and suggested it to

the President. Accordingly, such a commission was appointed in October, 1903. He selected the personnel and, as its secretary, planned and organized the work. The other members were W. A. Richards and F. H. Newell. At Mr. Pinchot's suggestion, the Commission was instructed to recommend such changes in the land laws "as are needed to effect the largest practicable disposition of the public lands to actual settlers who will build permanent homes, and to secure the fullest and most effective use of the resources of the public lands."

This Commission thoroughly investigated the whole subject of public lands and recommended legislation to prevent land frauds and to promote the building of homes. Its report was transmitted to Congress in a special message and resulted, among other things, in standardizing the work of the Land Office and in contributing to the repeal of the lieu land laws.

In 1906, a plan was suggested for a commission to study the rivers of the United States. Thus was originated the Inland Waterways Commission. The personnel was selected by Dr. W. J. McGee and Gifford Pinchot, who were also members of the Commission. The others were: Representative Theodore E. Burton, who was made chairman; Senators Francis G. Newlands, J. H. Bankhead, and William Warner, General A. Mackenzie, H. W. Smith, and F. H. Newell. This body made a comprehensive and exhaustive study of the rivers of the United States, which led to the trip of the President down the Mississippi in 1907. Its work crystallized the movement for waterway development in the United States and showed the need for orderly and scientific methods instead of "pork barrel" appropriations.

During the trip of the Inland Waterways Commission down the Mississippi the year after its appointment, the suggestion was made to the President to call together a conference of Governors at the White House for the purpose of discussing the conservation of our natural resources. The two men who carried through this plan to its completion were Dr. W. J. McGee and Gifford Pinchot. The Conference of Governors was held in May, 1908. The first result of this meeting was that the conservation movement was definitely established in the minds of the general public. Another far-reaching result was the evolution of a National Conservation Commission. Mr. Pinchot was made chairman. The Inland Waterways Commission was made the section of waterways.

After the National Conservation Commission had made its inventory of the natural resources of the United States, Mr. Pinchot originated and suggested to the President the plan, secured the approval of other countries, organized, and, as chairman, conducted the North American Conservation Congress (February, 1909). He went to Mexico and Canada to invite the respective Governments to appoint representatives to attend this congress. The results of the congress were the establishment of the principle of conservation among the governments of this continent, and the call, issued by the President, for an International Conservation Conference whose purpose was to take account of the natural resources available for the use of the people of the world.

Until recently it was the policy of the Government to grant water-power sites on public lands forever and without fee. As forester of the United States, Mr. Pinchot required

power companies seeking the use of National Forest lands to take out permits which provided for compensation to the Government for the privileges granted, and that title to such water-powers should revert to the Government at the end of a fixed period. This made the national control of water-power development on public lands a public question. These requirements were bitterly fought by the power interests. Yet under this policy water-power development has proceeded faster in the National Forests than anywhere else in the United States. The policy laid down by the Forest Service at that time is the position now taken by the conservationists. Many of the power companies have accepted the principle of fixed period of leases and compensation to the Government.

Mr. Pinchot has long believed that "the most useful citizen of this country is the man who makes his living from the land." With Sir Horace Plunkett he drew up the plan and suggested to the President the appointment of the Country Life Commission in order to make a systematic study of the betterment of rural conditions. The Commission was appointed August 10, 1908, and consisted of Liberty H. Bailey, Henry Wallace, Kenyon L. Butterfield, Walter H. Page, Charles S. Barrett, William A. Beard, and Gifford Pinchot. It held hearings at thirty places widely distributed throughout the United States, and sent out over 500,000 copies of a set of questions aiming at securing the opinions of the farmers themselves on the main aspects of country life.

The report of the Commission contained a searching analysis of the main deficiencies in country life, such as the general disregard of the inherent rights of land workers, bad

roads, poor marketing arrangements, inadequate sanitation, and isolation of woman's work on many farms. The Commission urged as remedies effective coöperation to put the farmers on a level with the organized interests with which they do business, education in country schools which will prepare children primarily for life on the farm, better roads, and parcel post. This report centered the Nation's attention on the need for better business, and better living on the farm, as well as better farming.

Mr. Pinchot is also President of the Pennsylvania Rural Progress Association, which is endeavoring to bring about better marketing conditions for the farmer of that state, and reduce the great differences between what the farmer gets for his crops and what the customer pays.

For many years Mr. Pinchot has been studying the causes and remedy for the decline of the country church. He has been very active in the work of educating the people to the fact that a prosperous country church means also prosperous farmers, and that a decline in the country church means also a decline in agricultural production.

In 1910, with C. O. Gill he planned and carried through a survey of all the conditions affecting the country church in two counties, one in Vermont and one in New York, and later published the results in a book called *The Country Church*. This investigation was the first thoroughgoing attempt to find out what was the matter with the country church. Later Mr. Pinchot with C. O. Gill planned and carried through an intensive survey of all the rural churches in Ohio. This latter work was done under direction of the Commission on Church and Country Life of the Federal Council of Churches, of which Mr. Pinchot is Chairman.

What Mr. Pinchot's value to the country has been was best expressed by Theodore Roosevelt,

"Gifford Pinchot is the man to whom the Nation owes most for what has been accomplished as regards the preservation of the natural resources of our country. He led, and indeed during its most vital period, embodied, the fight for the preservation through use of our forests. He played one of the leading parts in the effort to make the National Government the chief instrument in developing the irrigation of the arid West. He was the foremost leader in the great struggle to coördinate all our social and governmental forces in the effort to secure the adoption of a rational and far-seeing policy for securing the conservation of all our national resources. He was already in the Government service as head of the Forestry Bureau when I became President; he continued throughout my term not only as head of the Forest Service, but as the moving and directing spirit in most of the conservation work, and as counselor and assistant on most of the other work connected with the internal affairs of the country. Taking into account the varied nature of the work he did, its vital importance to the Nation, and the fact that as regards much of it he was practically breaking new ground, and taking into account also his tireless energy and activity, his fearlessness, his complete disinterestedness, his single-minded devotion to the interests of the plain people, and his extraordinary efficiency, I believe it is but just to say that among the many, many public officials who under my administration rendered literally invaluable service to the people of the United States, he, on the whole, stood first."

In March, 1920, Mr. Pinchot became the head of the Department of Forestry of Pennsylvania. When he took

charge this Department was grossly inefficient. By the summer of 1921 he had brought it to a high plane of efficiency. He was nominated for Governor of Pennsylvania upon the republican ticket May 16, 1922, and elected governor at the following regular election in November, 1922.

JOHN DAVEY

JOHN DAVEY

1846–1923

JOHN DAVEY, known as the father of tree surgery, by birth and by training was adapted to the mission which he was set to perform. Born of earnest parents of the middle-class agricultural people of England, he early learned many of the lessons which can be learned only on the farm. Under the tutelage of his father, who was superintendent in charge of a large farm, he mastered the rudiments of agriculture.

At eight years of age he was assigned to the lighter farm duties which required his attention for ten hours per day. As he grew older, his duties became more arduous and complicated, and his working hours longer. Applying himself with great diligence and care to his tasks, he had the unusual distinction of being assigned to a foremanship over an estate at the age of eighteen years. To his last day he blessed the great good fortune which permitted him to learn to *work*.

Flowers and ornamental shrubs had always had a fascination for him and so, at the age of twenty-one, he went to Torquay where he served an apprenticeship of six years in Horticulture, Floriculture, and Landscape Architecture. On the completion of this apprenticeship he came to America and located at Warren, Ohio, where for several years he conducted a landscape and greenhouse business. Then he moved to Kent, Ohio, where he conducted a similar business for nearly twenty years.

In the course of his handling of trees Mr. Davey observed certain things which became fundamental to his later discoveries and inventions in the surgical care of the individual tree. For instance, he noticed that if a stub were left in cutting off a branch, no effort seemed to be made by nature to cover the wound, and the resulting decay not only destroyed the stub but spread on and on down into the trunk from which the limb had sprung. He observed, on the other hand, that if the limb were cut flush with the shoulder or juncture with the trunk out of which it arose, nature immediately began an attempt to cover the wound by forming a callus over the wound.

In young vigorous trees and with small cuts, the healing was effected with such rapidity that the cuts were covered and sealed before decay could get started. However, with older trees and larger cuts the callus was not formed fast enough to protect the wound. The fibre ends of the wood were left exposed to the elements; water and spores of fungus were able to alight on this exposed wood and the insidious processes of decay were begun. Mr. Davey argued that a wooden house must be protected from decay and disintegration by paints or other water-proofing substances. Applying this same theory to the wounds of trees, he developed the principle that all exposed wood surfaces in a tree must be smoothed or trimmed to conform with the physiological processes of the tree, and then they must be sterilized and waterproofed in such a manner as to be impervious to water and fungus spores.

Then he observed in cross-sections of hollow trees that had been cut down that the callus which had been intended to cover the wound had instead bent inward, in the absence

of a supporting surface, and had formed spirals inside the edge of the cavity on either side of the opening. This led Mr. Davey to wonder whether or not it would be possible to replace the supporting surface artificially, and thereby induce the callus to heal over the face of the cavity naturally. Then began experiments lasting over a number of years. John Davey found by means of his research work that this result was altogether possible and did follow when proper treatment had been applied to the cavity.

Aside from these fundamental conceptions, he also noted that certain trees are structurally weak and he contrived methods for bracing them against the terrific stresses and strains which they must undergo in withstanding the heavy winds and snows and sleet storms.

Also his early work in agriculture taught him that trees are large plants and need great quantities of food and moisture. Most shade trees living upon lawns are deprived of their proper supply of water and decaying vegetation which enables them to flourish in the forests. The soil about them is packed down until it becomes almost impenetrable to water. The grass growing underneath absorbs a surprising amount of the water which would be available otherwise to the tree. Falling leaves are raked up as soon as they fall, instead of being permitted to decompose and to enter the soil again to enrich it. Because of these facts it became necessary for Mr. Davey to devise intricate methods for feeding and watering trees.

Out of these early principles laid down by John Davey has developed the whole present-day science of *tree surgery*, or *the preservation of trees as individuals*.

Forestry proper deals with the care of great groups of

trees; and in forestry the object is not the saving of the trees as individuals, but rather the planting of and caring for trees in such a manner that the greatest possible number of marketable trees can be produced with the least necessary expenditure of money. Forestry is to trees what the study and practice of agriculture is to the growing of corn, wheat, or other farm products. It is the province of tree surgery, on the other hand, to care for the millions of trees used for shade and ornamental purposes. Great shade trees can not be replaced within the ordinary lifetime of men; and so they must be preserved as long as possible where they stand.

Tree surgery is to-day a very exact science, developed to such a point within a generation of time. Started under John Davey's personal supervision, an organization of several hundred men has been built up to perform the work according to the very best principles. These men are selected very carefully from thousands of applications, because of their proper physical and mental qualifications. They are then given a rigorous training in a training squad at Kent, Ohio. Those who pass through this work successfully are assigned to field work under the supervision of master tree surgeons, and they grow in skill and knowledge, until after perhaps two years they are regarded as sufficiently accurate in the mechanical phases so that they can themselves supervise certain operations. But before a man is regarded as a master tree surgeon and fully equipped for the responsibilities of supervision, he must spend two school terms in the Davey Institute of Tree Surgery, a resident course established at Kent by John Davey and conducted by a corps of specialists, who instruct in botany, entomology, plant diseases, theo-

retical tree surgery, and other subjects dealing directly with the special subject of tree surgery.

This combination of practical and theoretical training is in accord with the best modern theories of education, and produces professional men of very great skill and knowledge of their work. In their field operations they are always under the close supervision of a chief expert, who travels from place to place inspecting the work which has been done and making sure that the workmanship is both mechanically and scientifically accurate, and according to the principles laid down as standard.

But Mr. Davey was not satisfied simply to have work conforming to already existing standards. He wanted to see the profession for which he was responsible grow in accuracy and develop as rapidly as experiments could permit. And so he organized a Research Department, which continuously tests and develops new methods and ideas connected with tree surgery. This department has contributed many very valuable improvements to the work, and every year it furnishes free information with regard to the care of trees to a great many people.

By means of this careful, systematic training, John Davey was able to multiply manyfold his own personal strength and effort in the care and preservation of the shade trees of America. Men trained and supervised in so careful a manner can not fail to render splendid service, and they have done so for a generation of time. They are a group of healthy, intelligent men, going about their work in small groups, scattered over the greater part of the United States, with the same zeal and intense interest in their work which they would display under the eyes of Mr. Davey himself. At

the present time Davey Tree Surgeons do a business of three quarters of a million dollars per year. John Davey was known to them as "Father John," and they to him as his "boys."

As implied by the name, the most interesting and complicated phase of tree surgery is concerned with the correction of diseased wounds and cavities and with any other deeply inflicted wound, such as one occasioned by a split crotch or by a serious mechanical injury, which would later be subject to infection and decay.

This type of wound or cavity necessitates a very serious and complicated operation requiring the most accurate skill and knowledge. It must never be entrusted to an untutored man. Opening the cavity with great care to protect the delicate edges of the bark, sap-wood, and cambium, and in such a way that the opening conforms to the normal flow of sap, the expert traces the decay to its furthest extent, just as a dentist is required to do in treating a human tooth. Then in much the same manner as a dentist operates, he must carve the walls of the cavity in such a way that the filling will be retained after it is in place. As soon as the cavity is open, the bark edges are immediately protected by a special substance to prevent the drying of the delicate living tissue lying underneath. Then after the cavity has been carved, it is carefully disinfected to destroy any possible remaining traces of decay fungus. After the disinfectant has dried, a special waterproofing substance called "Daveyite" is used to seal the wood completely from further exposure to moisture and fungus growth.

Just inside the opening of the cavity a "watershed groove" is carved with the utmost care for the purpose of

draining off any moisture which may gain entrance in spite of other precautions.

If the cavity is of any considerable size as compared with the size of the tree, it is necessary to replace the mechanical strength, which has been sapped by decay, by installing systems of steel bracing which are sometimes very complicated.

This shows the cavity properly excavated, carved, disinfected, and waterproofed. The bracing is installed in the directions to resist stresses of winds.

The filling is completed. By the use of sections, provision is made for the sway of the tree. Healing of the wound will result as the callus grows over the face of the filling.

The strains to which a tree is subjected because of heavy winds and the tremendous leverage brought to bear on the trunk of a tree will very quickly break and destroy it unless it has sufficient wood to support it, or a proper substitute for the wood.

After the opening and the cavity itself have been properly carved, disinfected, waterproofed, and braced, the cavity is

A graceful elm showing the feathered vase type of this tree. It required a century of time to produce this stately specimen. It is entitled to all the protection known to man.

ready for filling. This is done in the only manner which has ever been proved successful, — by the use of concrete applied in sections, each section separated entirely from the next by three-ply tarred paper which has been cut to the shape of the cavity. These sections are so contoured on either end as to resemble the shape and nature of the vertebræ of the human spine. This permits the tree to sway freely in the wind without in any manner harming the filling which has been built into it. This is necessary to successful cavity fillings for the reason that no solid concrete columns so strong as to resist its swaying in a severe storm can be formed in a tree.

When a cavity is filled as outlined above, it virtually becomes a part of the tree. What had been a crippled specimen, perhaps tottering ready to fall in a heavy storm, has been restored to strength, ready to withstand the buffets of the storms for many years to come. Shortly the callus begins to form on the edges and to creep slowly over the face of the filling, until after a period of several years it has been covered and the tree restored both in appearance and in fact to health and strength. It is then only a question of watching the tree for further weaknesses or accidental breaks, and of providing proper food and moisture as there may seem to be needed.

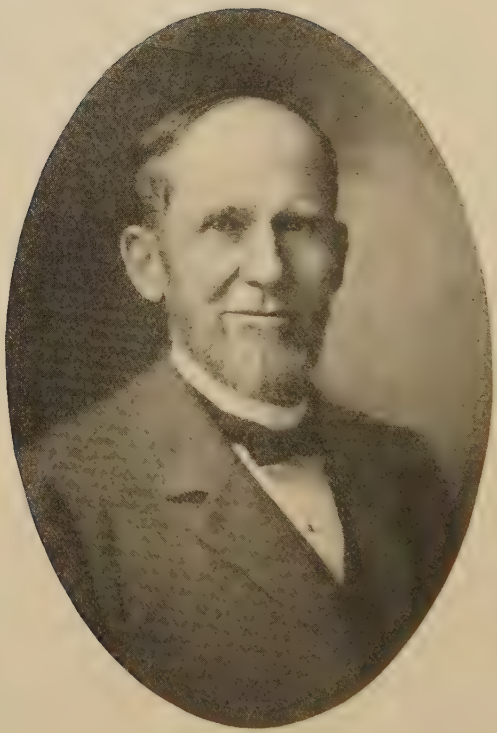
Watch must be kept against insect pests which may appear to ravage the leaves or bark or to bore into the trunk or large branches. Birds must be protected and encouraged to multiply in order that they may be able to destroy the insects which feed upon trees and other plants. No heavy fillings of earth about the roots of the tree must be permitted, for the reason that they shut off the necessary air and moisture from the roots and result in the speedy death of the trees by

The Washington Elm in Washington, D. C. It is said the life of this tree has been prolonged many years as the result of tree surgery.

suffocation. Care must be exercised in pruning young trees to avoid sharp, V-shaped crotches which are structurally weak and very easily tear apart in heavy winds. In no case should electric or telephone linemen be permitted to cut through a tree if it can be avoided in any way; if it should be necessary, it should be done with the aid of an expert. These are some of the bits of advice which Mr. Davey wished to give to Americans who love fine trees. If the majority of citizens would watch and help in these ways, many of the troubles which the tree surgeon is now called upon to relieve would never exist.

"Father John" grew old in the accomplishment of his life work. He was by nature optimistic, and he believed that America has grown much in the love of trees and in the appreciation of their great value in the more recent years. Abuses which were once permitted against trees have been lessened. More and more people are awakening to the needs of individual trees and to the necessity for the immediate development of a great constructive movement for reforestation. If the question were permitted to go unmet, America's forests would be practically exhausted within about thirty years. But John Davey believed that Americans are progressive and resourceful enough to meet this problem, when they see it, with all of the same energy with which they have met and overcome so many other difficulties in the past.

Probably no man has been more sincerely mourned than John Davey, when he died very suddenly on November 8, 1923. At the time of his death he had just completed a book which he believed to be his masterpiece, *The Planting and Care of Trees*. It is surely a fitting end to a life so useful that he was able to give great good to mankind even up to the last.



Seth Hocket Ellis

SETH HOCKET ELLIS

1830–1904

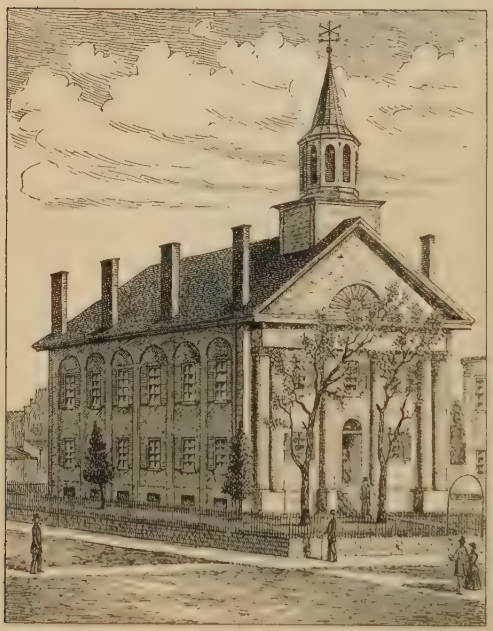
On a farm near Martinsville, Ohio, Seth H. Ellis was born, and his early years were not unlike those of other farm boys of that period, consisting of plenty of work and very meager schooling. It is probable that one year would cover the amount of his attendance at school, yet he was well educated, made so by his own study and observation.

His parents, Robert and Anna (Hocket) Ellis were Orthodox Friends, and their son was a birthright member of that denomination. Being a lover of music, he in early manhood changed to the Methodist society, but in after years when the Friends introduced singing into their worship, he returned to them.

His father was a substantial farmer, and his mother was above the average in ambition and mental capacity. He inherited from them those traits that made him so loved and honored by his friends and coworkers.

In 1851 he was married to Rebecca Tressler of Springboro, Ohio, and soon after they had established their home, the love of doing things for the betterment of his neighbors and of mankind began to manifest itself in church work and in community service. He began to organize Sunday Schools in the neighboring rural churches and schools, and, that they might be better able to function, he organized and taught classes in music.

In the early seventies, while entertaining his brother-in-law, John Miller, whose home was in Iowa, he learned of a new organization among the farmers of that state. He became interested and immediately got in touch with the National Grange committee of which Mr. G. H. Kelley was secretary and Mr. William Saunders, who was the originator of the Grange idea and of the Grange, was president or Most Worthy Grand Master, with offices in Washington.



Court House, Lebanon, Ohio. In this building on April 9, 1873, the final organization papers for the Ohio State Grange were signed.

With their permission and by their authority John Miller organized and instituted a Grange in Springboro, Warren County, Ohio, with Seth H. Ellis installed the first Worthy Master. This Grange was instituted October 1, 1872, and Mr. Ellis, having been appointed General Deputy, there were soon more than seventy Granges organized in nine counties.

With this number they felt the need of a central organization and on April 9, 1873, in Lebanon, the Ohio State

Grange was organized with Seth H. Ellis Worthy Master. He held this position by the unanimous vote of the Grange for twenty consecutive years.

His record was unique. During that period his influence was dominant, and his ability as a parliamentarian was demonstrated by the fact that an appeal from his decision was

In the National Normal University, located in Lebanon, the same village where the Ohio State Grange was brought into being, Agricultural Education for teachers was also started. Through the indirect efforts of Mr. Ellis and the direct efforts of Warren County, Ohio, farmers, one of the authors of this book began what was probably the first course in agriculture for teachers.

never sustained by the Grange in all that long period. As a presiding officer he was calm, dignified, inspiring, leading but never driving the assembly.

As the Grange grew in numbers and influence, he as their acknowledged leader became a person to be reckoned with

in legislation. Many of the laws favorable to farmers were passed as the result of his labors at Columbus. He very early urged the farmers to coöperate in all things for farm betterment.

The Ohio Agricultural and Mechanical College, now the Ohio State University, received a great deal of his time and attention. No effort was too great for him to make to provide for the better preparation of the rising generation for the duties of life.

His first appointment to the position on the University executive committee was given him by Governor Hoadly and was confirmed by each successive State Governor for many years.

While he was a member of this committee, the branch of agricultural experiment work was moved from the college grounds to the present location at Wooster, where it became the Ohio Agricultural Experiment Station. From its inception until the time of his death he was a member of the Board of Control. It was largely due to his untiring zeal for the institution that it became so soon recognized as one of the leading experiment stations in the United States.

For several years he was a member of the State Board of Agriculture, and it was during his term of office that the land was purchased that extended the State Fair grounds to its present dimensions.

He excelled as a speaker for Farmers' Institutes. He was fortunate in his choice of subjects and so honest and enthusiastic in his presentation of them that he was always in demand and there were no vacancies in his itinerary. As a speaker, he was clear, logical, convincing, winning his audience by sincerity rather than by the wiles of the orator.

He probably addressed more Ohio farmers than any other man in his generation, having spoken in practically every rural township in the Buckeye State.

Charles E. Thorne, Director of the Ohio Experiment Station for one third of a century, wrote the following tribute published in the Ohio State Grange Monthly:

"He always had the courage of his convictions and espoused causes which were for the time unpopular, but he lived to see many of them enacted into laws."

Few men in any state did more to build up scientific farming and a high regard for better living and social conditions in the rural districts than did Seth H. Ellis. He always said better farming was the result of constant toil and study. He also said every successful community must have a good school and a well-organized church. His work for the Ohio State Grange movement alone stands out as a monument to his memory. The great work of the Grange in Ohio and all the Worthy Masters since his time was very largely inspired by this first State Master. Every boy and girl who studies Ohio's early agricultural history expects to have Seth Ellis for one of the first lessons.

He died in June, 1904, honored and loved by thousands who knew him, leaving as a legacy to his seven children an untarnished reputation and the inheritance of healthy bodies and sound minds.

KENYON L. BUTTERFIELD

KENYON LEECH BUTTERFIELD

1868–

KENYON LEECH BUTTERFIELD was born on a farm at Lapeer, Michigan. He was educated in the public schools and entered the Michigan State Agricultural College in 1886, being graduated in 1891 as first in his class despite the fact that during his college term he taught district school two winters and was out of college one year working on the farm. During his college course he also won a prize medal for oratory open to all classes.

After graduation he was for a time Assistant Secretary of the College. He next was editor of the *Grange Visitor*, the organ of the Michigan State Grange. In 1895 the Farmers' Institute work was greatly enlarged in Michigan, and he was appointed superintendent. He organized the Institute work thoroughly, and Farmers' Institutes were held in nearly every county in the state. In 1902 he took his Master's degree at the University and for a year after taught Rural Sociology there. In 1903 he was elected President of the Rhode Island Agricultural College, where he remained three years. During this time he organized extension and field work throughout the state. In 1906 he was elected President of the Massachusetts Agricultural College, which position he held until he resigned to go to Michigan as President of the Michigan State Agricultural College.

His work at the Massachusetts Agricultural College has been characterized by

1. Marked improvement in the administrative organization of the entire institution, including the problem of business management, and the organization of teaching units.

2. Emphasis on the necessity of improving the social as well as the economic conditions of the farmer. On this subject President Butterfield is internationally recognized as an authority.

3. Material increase in the attendance of students, there now being three times as many enrolled in work of college grade as in 1906. In addition, a two-year course has been organized as well as a summer school, winter school, and other short courses. In 1920–21 approximately fifteen hundred students were at the college.

4. Increase in the current state support for the institution; a net increase in the state appropriation from $53,000 to $680,000 in 1921.

5. Addition of a number of new buildings for teaching purposes provided by the state appropriation. The inventory of the college increased from one half million in 1906 to nearly two million in 1921.

6. Organization and development of Extension Service.

President Butterfield was appointed by President Roosevelt a member of The Commission on Country Life; by President Wilson he was made a member of the commission to study European rural credit. He served in 1913 as first vice chairman and acting chairman in Europe of the American Commission on Agricultural Credit and Coöperation. In 1919 he was decorated by France as Officer of Public Instruction, and Officer of Agricultural Excellence. He is the author of *Chapters in Rural Progress; The Country Church and the Rural Problem;* and *The Farmer and the New Day.*

Mr. Butterfield is properly called a rural expert. No man in our nation has done more to make rural America a better place in which to live.

Dr. Butterfield's work in connection with the America Country Life Association has been of great value.

A new honor came to him in 1924 when he was elected President of the Michigan State Agricultural College, the institution from which he graduated.

Seaman A. Knapp

SEAMAN A. KNAPP

1833–1911

No American has had a greater agricultural influence over wide territory and over many years than had Seaman A. Knapp.

He was born in Schroon, New York, and was graduated from Union College, Schenectady, New York. He was Associate President of Troy Conference Seminary and Associate principal of Ripley Female College, Poultney, Vermont. After he moved to Benton County, Iowa, he became Superintendent of the State College for the Blind at Vinton, Iowa, engaged in intensified live-stock farming, was professor at the Iowa State Agricultural College at Ames, and was President of State College, 1884 to 1886. For a time he published and edited at Cedar Rapids, Iowa, the *Western Stock Journal and Farmer*. In 1886, at fifty-three years of age, Dr. Knapp was a national figure in progressive agriculture. He had been a successful live-stock farmer; editor and publisher of a farmers' paper; superintendent of a state institution; professor and president of the State Agricultural College.

Then he became literally a national, and soon after, an international figure in agriculture. For twelve years, until he was sixty-five years of age, he devoted himself to the improvement of farm conditions in Louisiana and neighboring states.

Twice, in 1898 and in 1901, Seaman Knapp was sent to China, Japan, and the Philippine Islands to report upon

conditions that might help agriculture in the Southern States, especially in the raising of rice. Upon the acquisition of Porto Rico, Mr. Knapp was sent there by the Government to help establish modern agriculture.

In 1903 the South was inflicted with the boll weevil, and the Government put Dr. Knapp in charge to protect the cotton fields from its ravages.

After he was seventy years of age, Dr. Knapp did his great work in the protection of cotton, and accomplished an even greater work in establishing and promoting the Boys' and Girls' Club Work of America, as a noble feature of the "Farmers' Coöperative Demonstration Work," which is one of the marvelous achievements of the United States Government.

The personality of Seaman A. Knapp was most compelling. St. Clair McKelway, for many years Editor of the *Brooklyn Eagle* and one of the outstanding figures in American life, said after hearing one of Mr. Knapp's addresses, "That man is a combination of Socrates, Horace Greeley, and Gladstone."

Brilliant as he was on the platform, Dr. Knapp always insisted that you could not do much to improve the farmer by talking at him.

"Farmers need object lessons, need demonstration," was his slogan.

The Club Work by the boys grew out of the Demonstration Work of their fathers. Other clubs had been tried, but they were schemes to increase attendance at farmers' meetings, and the boys grew a few ears of corn for judging and exhibit purposes. Dr. Knapp's boys demonstrated with an acre each. They wanted to do the manly thing and be like

their successful fathers. They considered cost of production and made showings of profit. They made exhibits, too, and they wrote histories of their crops. Often they delivered such histories in oral form at important meetings. Dozens of boys produced more than 200 bushels of corn per acre, and hundreds went above the 100-bushel mark. Walker

County agent giving a corn testing demonstration at a village store, Montgomery County, Maryland.

Lee Dunson, of Alabama, made the best record, which was 232.7 bushels at a cost of 19 cents per bushel. It was to be expected that these boys would make demonstrations with other crops and with live stock. They would gradually work into good farming. Thousands of them used their profits and their prize money to attend high schools and colleges in order better to prepare themselves for their life work. In the last year of his life Dr. Knapp said: "The home is the

mightiest force in molding the race and in shaping the destiny of mankind; the farm must feed the world; the boy must ultimately preside over the home and control the land. At last we have touched in this way the very heart and soul of teaching. We have coördinated and blended the teacher, the lesson, the boy, the farm, and the home. The same plans should be followed in instructing the girls in household science. Make a demonstration in the home. Prove up in the kitchen. Solve the problem of better nourishment and more economic living. Take the school garden to the home with the wealth of flowers and its lessons of beauty."

He urged the girls to grow and can vegetables and fruits also because it "would aid the family pocketbook and help the family character."

Three hundred girls were organized into clubs that year. They demonstrated with one-tenth acre of tomatoes each. Within two years the numbers had grown to 50,000. Not only in growing tomatoes, but in conserving them, these girls showed the wonderful effect of having thousands of people demonstrate the same thing at the same time. People studied tomatoes everywhere. The papers were full of facts and stories about "love apples." It was not long until the Club members took up peppers, which are botanical cousins to tomatoes. Then they took up okra, beans, peaches, berries, and other vegetables and fruits. If these girls had taken up a dozen vegetables at first, the public would have missed the point and the whole thing would have evaporated into thin air. Dr. Knapp in discussing this point always said, with a twinkle in his eye: "Don't confuse people by elaborate programs, the average man, like the crow, can not count more than three. Do the next thing." A great principle of mass

instruction is involved here. The girls carried their splendid achievements from the garden to the backyard, where they did their canning under the trees. Then their products went to the pantry and kitchen. They standardized their products till a visitor could go from Maryland to Texas and find the same high-class tomatoes, soup mixtures, Dixie relish and

Demonstration in grading vegetables.

B. S. Chutneys at every fair and on all markets. They took up poultry, and it is a common occurrence for a schoolgirl to clear three, four and even five hundred dollars a year upon her garden and poultry. Some have gone into these enterprises commercially and exceeded the thousand-dollar mark.

As was expected, the mothers joined in. In fact, the home was the objective from the beginning, and the idea was to secure the coöperation of the women by getting the girls to do something worth while. The first women agents knew,

after they had held their first conference in the United States Department of Agriculture, what the program should be. Mother and daughter joined hands in this great enterprise of Home Demonstration. They went into matters of home equipment, home arrangement, home building, and home beautification. From better canning outfits and steam

Demonstration in packing eggs.

pressure cookers they went on to waterworks, electric lights, and other improvements. They showed, "How to adorn a simple home and make it appear like a palace." They came, as a climax, to the ideal which the founder of the work outlined three years before the first woman agent was appointed:

"The farm must be made a place of beauty so attractive that every passing stranger inquires, 'Who lives in that lovely home?' The house is of minor consideration, the gorgeous setting of trees and shrubbery holds the eye."

While the men agents have made a great contribution to education and agriculture through the crop and live-stock demonstrations, the women have progressed still farther in this pioneer field. Other countries have county agents who are itinerant instructors, but this country leads the way into the home through women agents. An article in the *Yearbook*

County agent and club member comparing two baby beef calves, Marshall County, Iowa.

of the United States Department of Agriculture summarizes their work as follows:

"The annual tabulation of results shows an enrollment of hundreds of thousands of women and girls. The containers of canned, dried, preserved, cured, and brined products and the pounds of fresh products grown and put up by these workers from the gardens, orchards, vineyards, poultry-yards, and farms are measured in millions. Better kitchens and labor-saving devices acquired through the influence of the

work are reported in thousands, while such equipment as waterworks, lighting and heating systems, washing machines, sewing machines, pictures, draperies, rugs, and other furnishings are also reported in thousands. New homes, rebuilt and rearranged homes, with their beautiful lawns and harmonious farmsteads, are told in columns of five figures. There has been a growth of the group idea because of the common purposes; there are now thousands of clubs and an evolution of community organizations, based upon such a foundation as gives promise of a better national life and a fuller civilization."

In fifteen years, 1905 to 1920, the United States Government increased its appropriation for the work started by Dr. Knapp from $40,000 to $15,000,000.

The really great agriculturalists of his day were most exuberant in his praise. One of the ablest economists of the country said after seeing what he was accomplishing, "Seaman A. Knapp is one of the greatest agricultural leaders that America has produced." He died in Washington, D. C., April 1, 1911.

(JOHN) HERBERT QUICK

1861–

Herbert Quick was born in a frontier cabin on the line between Hardin and Grundy Counties in Iowa. His people were farmers, and he was a hard-working boy until he was well past twenty years old.

He was named John Herbert Quick, but was always called "Herbert" by his friends, and, when he began publishing his writings, he dropped the first name because it did not seem natural to him to be called "John."

Owing to the stress of hard times and family misfortunes in the way of diseases incident to frontier life, he never was able to attend any schools except the rural schools of his farm neighborhood.

When he was a baby, he was afflicted by infantile paralysis. It was very difficult for him, therefore, to endure the hard work of the farm, and after teaching country school for some years, he went into village and city school work. His scholarship was sound, and he was regarded as an excellent teacher. He was in demand as an instructor in County Institutes because of the skill with which he inspired the teachers to "know more and read more." He was a notable example of the possibilities for one who had learned out of school and was always learning out of school. His influence in toning up the qualifications of country teachers was recognized in many counties.

He decided when he was about twenty-four years of age

that his lack of higher education in the ordinary sense would prevent his rising in the educational field and that he would study law. He read law in the office of Hon. John Cliggitt, a learned lawyer, in Mason City, Iowa, and was admitted to the bar. While studying law, he was a ward principal in the Mason City public schools.

On being admitted to the bar, he removed to Sioux City, Iowa, in 1890, and practiced law for seventeen years. He served one term as Mayor of Sioux City. He was nominated for the office of Justice of the Supreme Court of the state but it was an "off" year for his party.

He always had an ambition to write but hesitated to offer anything for publication. His first traceable success was in *The Century Magazine*, a bit of verse named "A Whiff of Smoke," which expressed the thoughts of one who had lived the life of the prairies and was reminded of it by the smell of burning grass.

His first editorial work shows his continued interest in farm life. He took up the editorial work of a farm paper published in Sioux City, which was devoted to the idea of helping the people in the semi-arid West to grow better crops with their scanty rainfall. The ideas in this pioneer publication finally spread and resulted in the formation of the American Dry Farming Congress.

He was forty years old when his first book was published. It was a book of fairy tales based on the myths of the North American Indians, and was entitled *In the Fairyland of America*. Then he began producing novels and in a few years felt justified in closing his law office and devoting himself to writing. In a most unexpected way an invitation came to him to take charge of the editorial work of *Farm*

Herbert Quick

and Fireside, published at Springfield, Ohio. He had then for a few months been Associate Editor of *LaFollette's Weekly* at Madison, Wisconsin.

For several years he devoted himself to building up this farm paper in influence and power, until it became one of the most influential farm papers in the United States. When he relinquished the editorship, it had a circulation of nearly three quarters of a million and was active in all matters relating to farm life.

His fundamental interest in farm life was that it should become more and more intelligent and less and less overshadowed by city and town life. To this end he devoted himself to the idea of a new kind of rural school. He felt that his long experience as a teacher, and especially as a rural teacher, and his life of a quarter of a century on a farm might make his thoughts valuable. He believed that rural schools are not what they should be mainly because they are copies of city schools. He urged that as soon as a child enters school, it should begin to handle, inspect, analyse, read about, write about, and cipher about the things of the farm. The farm life, the farm neighborhood life, the marketing problems, the plants both useful and noxious, the insects, the nutritional problems of the poultry yard and the feed yard, the problem of fertility, and farm organizations, all make up a great collection of things which the rural school should study. There is no end to the work connected with farm life which the rural school can do. The rural school should not study about life; it should study life itself. He felt that such a system of schools would cure much of the discontent of the farmers with farm life by showing them a new world, so interesting, so absorbing, and so profitable to study that no

one would leave the country for the sake of giving the children an opportunity for better schooling.

For these thoughts he was much indebted to such school work as that done by some of the better consolidated rural schools of Ohio and Indiana, but particularly by the rural schools of Cook County, Illinois, under Superintendent Edward J. Tobin, and of those of Page County, Iowa, under Miss Jessie Field and by Mrs. Marie Turner Harvey of the Porter Community, Kirksville, Missouri.

It was his habit as editor of *Farm and Fireside* to publish every year, beginning in the fall, a serial story. He found great difficulty in finding stories which seemed fitted to the needs of his people, so one summer he determined to write the serial himself. He had previously published several novels so the work was not new to him, but he decided to embody his educational ideas in a story. The result was his greatest educational work, *The Brown Mouse*. This has been compared to Pestalozzi's masterpiece, *Leonard and Gertrude*, which tells of the gradual transformation of a Swiss village under the educational work of a good woman. Herbert Quick's story tells of the transformation of a rural neighborhood by a rural schoolmaster who puts the children, and finally the whole neighborhood, in training for life by studying life as it exists in every farming community. Educators of the more advanced group regard this as the greatest work which he has done. He was surprised at the intense interest it commanded from the people for whom it was written — the farmers, most of whose children, like those of Mr. Quick himself, could never hope to attend any school except that of the neighborhood.

His chief interest in the farm life of the United States lay,

and still lies, in building up a full, unfearing, and high human life on the land. He sees how farmers have tended to a place of confessed inferiority to the cities in other civilizations, and he throws himself into the struggle to prevent this in this country. He regards farm economics as so important that he devoted much effort to it as editor of *Farm and Fireside*. When President Wilson came to appoint the Federal Farm Loan Board, although he had no acquaintance with Mr. Quick, he asked him to take one of the four appointive places on the board. Mr. Quick had had a good deal to do with the formulating of the law under which this Board was to function. He was regarded as one of the few experts in rural credits in the nation. He had been Chairman of the Executive Committee of the American Rural Credits Association which had been working for the law.

Although it was a financial sacrifice, he decided to accept and was appointed for a term of seven years. After two years the Federal Farm Bureau was organized and prospered. More than ten thousand National Farm Loan Associations had been organized, the twelve Federal Farm Loan Banks were all in good hands and prosperous, and Mr. Quick felt that he could now lay down the work of rural finance and go back to his writing. So he resigned and went back to his orchard farm in Morgan County, West Virginia, where he now lives.

In 1919 he went as a colonel to Siberia for the American Red Cross to help close up the work of that organization in Siberia and was very ill in Vladivostok. After that he was in the hospital for a long time. Since his return he has written much. His chief work has been the completion of a long novel which he has had in hand for many years, and

which was published in January, 1921, under the title, *Vandemark's Folly*. It is a story of the soil. It tells the life history of a poor boy who settled in Iowa in the fifties, and is an epic of the development of the Mid-West. He regards it as the best of all his works from an artistic point of view.

A list of his books includes *In the Fairyland of America*, 1902; *Aladdin & Co.*, 1904; *Double Trouble*, 1905; *The Broken Lance*, 1907; *American Inland Waterways*, 1909; *Virginia of the Air Lanes*, 1909; *Yellowstone Nights*, 1911; *On Board the Good Ship Earth*, 1913; *The Brown Mouse*, 1915; *From War to Peace*, 1919; *The Fairview Idea*, 1919; *Vandemark's Folly*, 1921.

SOIL EXPERTS

SIR JOHN BENNET LAWES

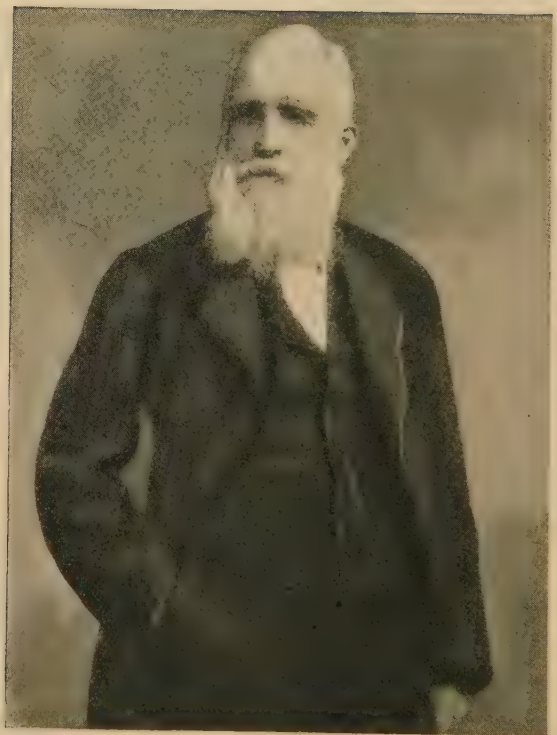
1814–1900

Sir John Bennet Lawes was born in the parish of Harpenden, Herts, at the manor house of Rothamstead. The Rothamstead farm later became the scene of Sir John's great work which was of unmeasurable value to agricultural science.

He took personal management of the farm at Rothamstead in 1834. He was an expert chemist and very early determined to learn, if possible, more about the relation between chemistry and agriculture. He had studied the work of Theodore De Saussure on the nutrition of plants, the work of J. B. Boussingault and Justus von Liebig on the chemistry of the soil. Sir John and Sir Joseph Henry Gilbert coöperated at the Rothamstead farm to test the theories of De Saussure, Boussingault, and Liebig in actual field practice.

In 1837 Sir John began experiments with agricultural plants, setting them in pots. He used artificial fertilizers containing plant foods in these pots and by so doing started a system of feeding plants by artificial means. This caused him to be called the father of artificial fertilizers and to be recognized as a great benefactor of agriculture.

He patented some of these artificial fertilizers and began their manufacture in London. This enterprise yielded large profits and took much of his time. He, therefore decided to employ a chemist who had studied under Liebig to aid him in his agricultural investigations. On the



Courtesy U. S. Dept. of Agriculture.

SIR JOHN BENNET LAWES

recommendation of Dr. A. T. Thomson, Dr. Joseph Henry Gilbert was employed.

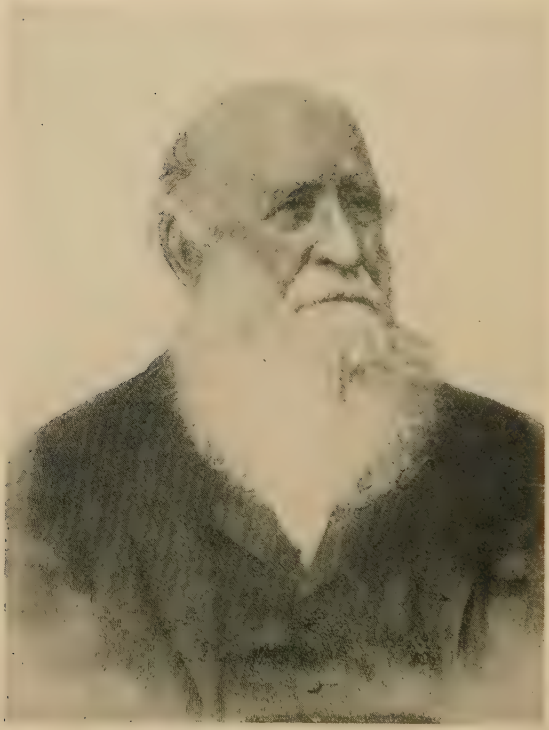
Dr. Gilbert entered upon his work at Rothamstead in 1843 and made rapid progress from the first. He began systematic field experiments on turnips and wheat, and the wheat field has grown wheat without intermission ever since. In 1847 field experiments on beans, in 1848 on clover, in 1851 on the rotations of wheat and fallow and wheat and beans, in 1852 on barley, in 1856 on grass land, were started. Experiments in pig feeding began in 1850.

These experiments were a new undertaking and received marked appreciation from both scientific and practical men. The farmers of Hertfordshire at a meeting on December 24, 1853 sent Sir John a circular expressing thanks for his work.

He became a Fellow of the Royal Society in 1854, and in 1867 a Royal medal was awarded to him and Dr. Gilbert for their work upon agricultural chemistry. He early conceived the idea of perpetuating the work at the Rothamstead farm by placing it under a board of trustees with a permanent endowment for its maintenance.

A jubilee celebrating the beginning of agricultural experiments in the world was held July 29, 1893. This celebration was to commemorate the completion of fifty years of continuous experiments at Rothamstead by Sir John Bennet Lawes and Sir Joseph Henry Gilbert.

It is gratifying to realize that the world recognized Sir John Bennet Lawes' achievements during his lifetime. Seven years later, on August 31, 1900, he died at Rothamstead leaving behind him the accomplishment of the work and teaching of two generations of men.



Courtesy U. S. Dept. of Agriculture.

SIR JOSEPH HENRY GILBERT

SIR JOSEPH HENRY GILBERT

1817–1901

Sir Joseph Henry Gilbert was born at Hull. His parents removed to Nottingham in 1825 where Joseph spent his boyhood days. Here be began his elementary school work under the direction of a blind teacher, but later he was instructed by Mr. Long at Mansfield. He went to London in 1839 to attend the University College. At London he attended the lectures on chemistry delivered by Professor T. Graham, studied philosophy under J. Sylvester, and anatomy under Dr. Grant. He went to Germany in 1840, studied in the laboratory of Professor Liebig, and later received the degree of Ph. D. at Giessen.

Shortly after, on June 1, 1843, Dr. Gilbert entered upon his work at Rothamstead and continued with Sir John Lawes there until the death of Sir John in 1900.

The work at Rothamstead was accomplished by the combined efforts of Dr. Lawes and Dr. Gilbert. Dr. Lawes directed the agricultural operations in the experimental field and Dr. Gilbert was in charge of executing the follow-up and research work. The formal reports of this research work at Rothamstead were made by Dr. Gilbert.

The wonderful work of Dr. Gilbert was recognized by Dr. Lawes when he said, "To Dr. Gilbert I consider a debt of gratitude is due from myself and from every agriculturist in Great Britain."

Sir Joseph Henry Gilbert was an active member of many

scientific societies and also acted as scientific adviser to Dr. Lawes and others in their private commercial enterprises.

He traveled widely throughout Europe and made three visits to Canada and the United States for the purpose of study and research and to lecture upon the Rothamstead Experiments.

Dr. Gilbert was made Professor of Rural Economy in the University of Oxford in 1884, which position he held for six years. He received the honorary degree of L.L.D. from Glasgow in 1883; M.A. from Oxford in 1884; L.L.D from Edinburgh in 1890; and D. Sc. from Cambridge in 1894. He died December 23, 1901 in his eighty-fifth year at Harpenden.

WILBUR OLIN ATWATER

1844–1907

Few men have done more for the promotion of scientific farming than did Wilbur Olin Atwater.

He was born at Johnsburg, New York, and received his academic training at the University of Vermont and at Wesleyan University in Middletown, Connecticut, being graduated from the Connecticut institution in 1865. He secured a Ph.D. degree from Yale in 1869. While at Yale he spent much time studying Agricultural Chemistry. His analyses of several varieties of Indian corn while still at Yale was the first work of the kind to be done on this side of the Atlantic.

He went to Europe to attend the Universities of Leipsic and Berlin and while there became acquainted with the European agricultural experiment stations. Upon his return from Europe he became a professor at Knoxville, in the University of Tennessee and at the Miami State College. He accepted the position of professor of chemistry at Wesleyan University in 1873 where he came into close touch with Professors Johnson and Brewer of New Haven as well as other agricultural leaders of Connecticut. At Wesleyan Professor Atwater had his laboratory for more than thirty years in the Natural Science hall which had been donated to the institution by Orange Judd, the founder and long-time editor of the *American Agriculturist.*

When the State Board of Agriculture of Connecticut

met in December, 1873, Professors Johnson and Atwater were present and urged the Board to establish a station in Connecticut after the European plan. The project was promoted, but little interest was taken in it by the great mass of farmers. The enterprise was progressing rather slowly when Mr. Judd offered to give $1000 personally and, as a representative of the Board of Trustees of Wesleyan University, offered the free use of the chemical laboratory to establish a station. These offers were made, however, on condition that the State legislature should appropriate $2000 per annum for two years to support the station, an appropriation which was unanimously made by the Connecticut legislature July 2, 1875. Professor Atwater was called to be the first director of the first experiment station in the United States at Middletown, Connecticut, in October, 1875. At the end of the two years' period, as provided in the original bill, the station passed under direct control of the state and was permanently located at New Haven.

Between 1875 and 1881 Professor Atwater organized and superintended an extensive series of field experiments with fertilizers and prepared about seventy articles on science as applied to farming for the *American Agriculturist*, the Orange Judd paper.

The success of the Connecticut enterprise brought about a demand for stations in other states, and Professor Atwater was always in close touch with the national movement. When Congress was asked to support with funds the stations in all the states, Professor Atwater was one of the foremost leaders to urge the adoption of the measure.

Professor Atwater was very definite in what he believed

Wilbur Olin Atwater

the agricultural stations should undertake as he indicated in a report submitted in 1887 by a committee of the Association of American Agricultural Colleges and Experiment Stations of which he was chairman.

"It is essential that they recognize the immediate demand for things immediately useful; that they find what questions are of direct practical importance and give such questions an amount of early attention which under other circumstances might be disproportionate. But it is vitally important that the highest scientific ideal be maintained and every effort be made toward its realization. The future usefulness of the stations will depend upon what they discover of permanent value, and this must come largely from the most abstract and profound research; to forget this will be fatal."

The Hatch Act was passed by Congress in 1887. This act gave each state and territory an annual grant of $15,000 for the maintenance of one or more experiment stations. The Storrs Station in Connecticut was organized following the passage of the Hatch Act by the legislature of that state and given half of the annual income derived by the act. Professor Atwater was then appointed director of the Storrs station and held this position for fourteen years. While director of the Storrs Station, during the period from 1888 to 1892, he continued his studies on the acquisition of atmospheric nitrogen by plants.

Mr. Atwater's great work was recognized by Norman J. Colman, who was then Commissioner of Agriculture, and who afterwards became the first Secretary of Agriculture. He invited Professor Atwater to become the first director of the Office of Experiment Stations, which was a newly-created office of very great importance. Professor Atwater accepted

this new position but retained the directorship at Storrs (Connecticut) as well as his college professorship. As the first director in this new office he was largely responsible for the policy of the stations. The following statements from his first report indicate what he believed to be the function of this new office:

"The most immediately pressing need seems to be that of a clearing house and an exchange for the stations. The stations are widely separated; they need to know more about each other's work; they need each other's help, especially that which comes from the interchange of experience. Much is gained by the proper distribution of work and by coöperation where that is feasible. As a clearing house this Office can facilitate intercommunication between the stations, collate the results of their work, and facilitate its most advantageous coördination. It can serve as an exchange or distributing point for information in two ways, negotiating between the stations and the agricultural public, on the one side, and between the stations and the world of science, on the other.

"One of the means by which this Department can mediate between the stations and the agricultural public is the issuing of a series of farmers' bulletins, which should collate the results of station work bearing upon special topics, and the teachings of other research and put the whole into a form so plain that the intelligent farmer will understand it, so brief that he will read it through, and so practical that he will take it to heart. Thus, while each station is distributing its own results to the farmer of its own State, this instrumentality will help to make the several stations serviceable to the agriculture of the whole country.

"As a mediator between the stations and the world of science this branch of the Department should be in a condition to collate the results of experimental research in this country and in Europe, and to publish them in convenient form for the use of the station workers and others interested in the science of agriculture.

"One need is a journal for the stations, to contain accounts of their current research, abstracts of similar work in this and in other countries, and other matters of mutual interest.

"Information is also greatly needed in regard to past work and its results. This would be probably best brought to the stations in the form of monographs on special subjects."

The Office of Experiment Stations was very successful under the direction of Professor Atwater, but, after the growth of the movement had become so rapid, a director who would give his full time was needed. Professor Atwater, being unwilling to give up his teaching and investigations, resigned as director of the Office in 1891.

Other important work carried on by Professor Atwater was told by the editor of *The Experiment Station Record* in the number of October, 1907, which was published soon after his death.

"Parallel with his studies in agricultural chemistry, Professor Atwater began at an early day to carry on investigations in physiological chemistry, with special reference to the problems of human nutrition. These studies soon brought him into official relations with national and state organizations having funds which could be used to promote research in these lines. Between 1879 and 1883 he made a

series of analyses of fish for the U. S. Fish Commission and of the flesh of domestic animals for the Smithsonian Institution. Studies of the dietaries of people in Massachusetts and Canada were also made for the Massachusetts Bureau of Statistics and Labor and published in 1886.

"Similar work was instituted in connection with the Storrs Experiment Station, and in 1893 with the aid of Hon. J. Sterling Morton, who was then Secretary of Agriculture, an appropriation was obtained from Congress for investigations in human nutrition in coöperation with the experiment stations. Headquarters for this enterprise were established at Middletown, Connecticut, and Professor Atwater was made its official chief. This work was broadly planned and steadily developed in succeeding years, until it became the most comprehensive investigation on this subject ever undertaken. The coöperation of universities, colleges, and schools, experiment stations, public institutions, and private organizations of various kinds was secured in different parts of the country. Hundreds of dietary studies of people of different occupations were made and the results of similar studies throughout the world were collated. Numerous digestion experiments with men were carried on and special studies made of the nutritive value of different cereals, meats, vegetables, fruits, and nuts, the effects of cooking and other forms of preparation on nutritive value, and other important food problems. Special efforts were made to improve methods and apparatus for such work.

"From a scientific point of view, the most important result of these investigations was the development and use by Professor Atwater and his associates of special forms of bomb and respiration calorimeters. An instrument was thus pro-

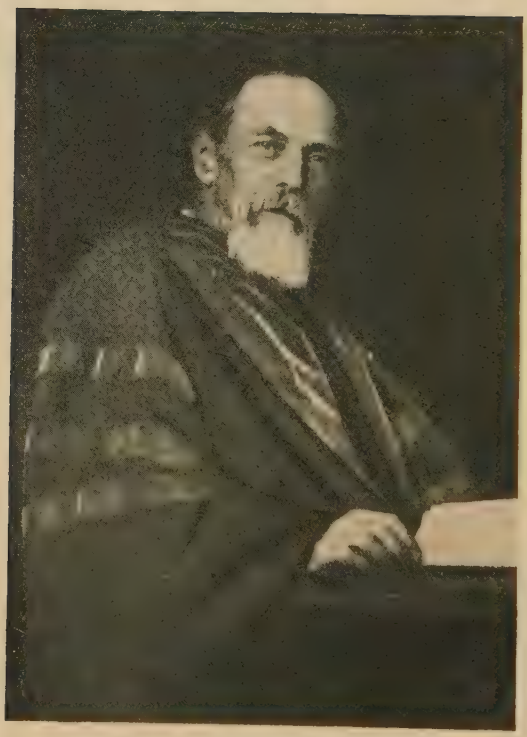
vided for studying the effect of food in the development of energy, which surpasses all apparatus of the kind in range and accuracy of operation. As a direct outcome of this work, a respiration calorimeter for use with the larger domestic animals has been constructed by Doctor Armsby at State College, Pennsylvania. The studies in human nutrition already made with the Atwater-Rosa-Benedict calorimeter have been very important and promise to be still more so. Direct evidence has been obtained that the law of the conservation of energy holds good in the utilization of food in the human body, as well as important data regarding the actual nutritive value of different foods and the relations of food to muscular energy and mental work.

"As the Chief of Nutrition Investigations in the Office of Experiment Stations, Professor Atwater planned and supervised investigations which were carried on in about twenty states. The results of this work are embodied in about one hundred technical and popular publications issued by this Department and the Storrs Experiment Station.

"These publications have had a wide distribution and have been extensively utilized in domestic science courses in colleges and schools throughout the country and in the preparation of textbooks and manuals on human nutrition in this and other countries.

"In the judgment of competent experts, the nutrition investigations conducted under Professor Atwater's direction were more thorough in their scientific methods, more extended in the scope and amount of investigation, and more useful in the distribution and practical application of their results than any other inquiry of the kind ever undertaken in this country or in Europe.

"As a public official working in a wide way in the organization and management of enterprise for the general good, Professor Atwater has earned the lasting gratitude of his countrymen, especially by what he did in connection with the agricultural experiment stations and the nutrition investigations. To this work he brought a well-trained mind and a true scientific purpose. He had the enthusiasm and persistence necessary to impress other men with the importance of his enterprises and to carry him successfully over periods of opposition and discouragement. He had unusual ability in the conception and formulation of broad lines of work, and in attracting and holding men competent to give him such aid as he needed to complete these plans, put them into successful operation, and secure substantial results."



Eugene Woldemar Hilgard

EUGENE WOLDEMAR HILGARD

1833–1916

The death of Dr. Eugene Woldemar Hilgard of California brought to a close a career of service to agriculture notable not only in length but also in accomplishment. Dr. Hilgard dealt with the very fundamentals of agricultural advancement at a period when encouragement to agricultural institutions was meager and financial support was correspondingly limited. He persevered, and reward came during his active years in a world-wide recognition which gave him an undisputed place among the leaders and gave agriculture its rank in the University and state of California.

Eugene Woldemar Hilgard was born at Zweibrucken, Rhenish Bavaria. When he was three years old, his father brought the family to America and settled on a farm in Illinois. The father had an educational ideal which the school system of this state could not meet at the time, so he personally undertook the training of his son. Eugene was ready for the university at the age of sixteen and was sent to Heidelberg where four years later he received his Doctor's degree.

Dr. Hilgard's contributions to science began while he was yet a student. His early desire for investigation and research manifested itself in an experiment on himself with a poisonous dose of arsenic to ascertain its effects; it is perhaps needless to add that at the critical moment

he took the antidote. In his graduating thesis he was the first to distinguish and define the four parts of the candle flame and the processes occuring in each. The two years following his graduation at Heidelberg were spent in pursuing studies and attending lectures which would fit him for what he then thought was to be his life work — the practice of medicine. He soon abandoned this idea for what he felt was a broader and more interesting field for investigation and research, chemistry, geology, and botany.

A short time before returning to America in 1855, he spent several months in Spain where he met Miss Alexandrina Bello of Madrid who a few years later became his wife.

His first work after returning to America was that of chemist at the Smithsonian Institution at Washington. He very soon resigned this position to become assistant state geologist of Mississippi. He accepted this position amid the sincere condolences of his scientific friends on his assignment to so uninteresting a field.

When Mr. Hilgard began his survey of the state of Mississippi, he saw that it could never maintain itself in the public esteem on the basis of mineral discoveries alone but that it must seek its main support in the service it might render to agriculture. He paid particular attention to vegetation, soils, water supply, and marls. As he moved from place to place in search of geological outcrops, he noted the evident differences in the native tree and plant growth on the several types of soil, and the differences in behavior and durability of soils under continued cultivation. Mississippi seems to have been especially suitable for such observations, for it is very largely covered with a growth

of native timber and has a great variety of soils. The State University fitted up for him a small chemical laboratory where he made analyses of soils, marls, etc., using one hand, as he said, to make the chemical analysis, and the other to write the report. This report was finished and printed and is still regarded as a standard authority on the geological formations and soils of Mississippi and the Southwest.

During the Civil War he was placed in charge of the library and equipment of the State University of Mississippi, and, when the university was reorganized in 1866, he was elected Professor of Chemistry. This title was changed in 1871, and he was known as Professor of Experimental and Agricultural Chemistry. In the laboratory he experimented with the chemical and physical properties of soils in their relation to crop production and established a small farm for culture experiments.

At the request of the Smithsonian Institution and of the New Orleans Academy of Sciences he extended his researches down the Mississippi River to the Passes and through Louisiana. In addition to this work he prepared cotton-culture reports.

Half a century ago, farseeing farmers began to realize that science could do more for farming than tradition, and that the mainspring of rational farming was natural science. This was simply the evolution of ideas which for decades had been permeating the minds of thoughtful agriculturists. The enlistment of science as an aid to agriculture was urged by the University of California, and it was decided that Hilgard was the best choice for the professor to give form and plan to this interpretation of agriculture in the College

of Agriculture, and in 1875 he was elected Professor of Agriculture.

A recent writer has well said: "The results of his labors are the warp of California's first half century of intellectual and industrial life, and upon such enduring work as he achieved will be spread the splendid fabric of our coming state advancement and development." The problems which faced Hilgard at the beginning of his work as Professor of Agriculture in the University of California may be stated thus:

1. Demonstrating practical value in the work he could do, that the farming constituency might become interested.

2. Securing recognition of agriculture as a subject suitable to incorporate in the course of study for those desiring advanced knowledge.

3. Securing funds to pursue research.

The State Master of the organization which set itself and its ten thousand members to the task of segregation of the College of Agriculture from the University presented in the constitutional convention of 1879 the article which made the organic act of the University a part of the Constitution of the state. This accomplishment profoundly affected the development of this institution.

He said in his report of 1877, "A knowledge of facts and principles and not the achievement of manual dexterity must be the leading object of a truly useful course of instruction in agriculture. Object teaching should be made the preëminent method of instruction in natural, and more especially in technical science. Manual exercise should be made the adjunct of the instruction in principles."

The vocational nature of the work was made plain, and

he added to his staff next an instructor in practical agriculture. His greatest opportunity for effective service came when he was given full charge of the cotton investigation for the Census of 1880. He was promised funds for inquiry, investigation, laboratory work and whatever else he deemed necessary to get at the facts and principles connected with this industry in the United States. He selected assistants who studied cotton producing conditions from every angle of quality, quantity, culture, and use. California was so ably featured as a habitat of the plant, and the natural conditions so ably set forth that his work was not only accepted as valuable from the standpoint of the Government but California was placed in a new light before the world. He raised to a higher plane the value of research as an aid to scientific development, and it was thereafter easier to get the funds necessary to aid in research work.

In 1875 he was given the use of a small tract of land on which he established one of the first experiment stations in the United States. He later established several outlying substations. These were located at points where climatic conditions differed.

During the whole period of his academic career, Professor Hilgard was constantly active in authorship. In addition to formal reports, he wrote much for agricultural and scientific periodicals. This was mainly along the subject of soils, in which field he was not only a pioneer but also a most valuable contributor. His book on *Soils: Their Formation, Properties and Relations to Climate and Plant Growth in the Humid and Arid Regions*, represents his best contribution to this subject.

Among his California activities there stand out promi-

nently his studies on humid and arid soils, in which he was the first to point out their differences in depth and in physical and chemical characteristics. He was the first to explain endurance of drouth by culture crops in arid soils and why sandy soils are among the most productive in the arid region and the least so in the humid.

Hilgard Hall was built as a monument for Professor E. W. Hilgard. It is the building on the left where the ten massive pillars appear. Above these pillars we read the following inscription: "To Rescue for Human Society the Native Values of Rural Life." The statement expresses the aim of the institution. The building at the right is Agriculture Hall.

His successful researches into the cause and occurrence of alkali salts, their effect on vegetation, and the methods to be used in their neutralization and the reclamation of the land in which they occur are well known. He was the first to enter this field and the results of his experiments have been extensively quoted and his bulletins published in other countries where alkali lands exist.

While Professor Hilgard was not the first to make a soil survey or a chemical analysis of the soil, he was the first to interpret the result of analyses in their relation to plant life and productiveness. He was also known for his knowledge of the origin and physics of the soil.

The State of California has memorialized the name of its pioneer agriculturist by erecting to his memory Hilgard Hall, one of a group of buildings which will form the agricultural quadrangle of the University. It has been felt that his firm stand with reference to the dignity and pedagogical value of agricultural science at the early period when so many institutions, now great, were in the formative stages, has exerted a profound influence upon the development of agricultural education.

Franklin Hiram King

FRANKLIN HIRAM KING

1848–1911

Franklin Hiram King was born on a farm near Whitewater, Walworth County, Wisconsin. He was graduated from the State Normal School at Whitewater in 1872, where under the inspiring teaching of Professor T. C. Chamberlin, the distinguished geologist, he had received his first and strongest impulse to scientific study. He became especially interested in the study of the natural sciences during his course in the normal school and after graduation worked and studied with Professor Chamberlin for a year before joining him in work on the State Geological Survey.

For three years, 1873–1876, he taught science in the high school of Berlin, Wisconsin. During that time he published a scheme for plant analysis which was afterwards incorporated in Wood's botanical textbooks. Following an expedition for the geological survey of the Flambeau River in northern Wisconsin, he spent two years in special study of physics, chemistry, biology, and geology at Cornell University. During this period he completed a careful study (begun during his vacations at the Berlin high school) of the food habits of Wisconsin birds, which was published in a report of the State Geological Survey under the title of "Economic Relations of Wisconsin Birds."

For ten years, 1878–1888, Professor King taught science in the State Normal School at River Falls, Wisconsin, one summer during this period being spent at the Johns Hopkins

Seaside Laboratory, then at Beaufort, North Carolina, and another with the U. S. Geological Survey in the study of terminal moraines in North Dakota.

It was during this period that he undertook, with the aid of his wife, the preparation of relief models and maps for use in instruction in physiography and meteorology, devising a mechanical method for rapid and exact reproduction of such maps and models, many of which were prepared for various educational institutions in this country.

Professor King's broader career as an agricultural educator and investigator may be said to date from 1888, when he accepted the chair of Agricultural Physics in the University of Wisconsin, the first of its kind to be established in this country. Here he opened up the important but neglected field of physics as applied to agriculture and laid the foundations of a science of rural engineering. In this field his contributions were as varied as they were valuable. He reported work of a fundamental character on the movement and conservation of soil water, the soluble salts of the soil in relation to soil fertility and the conditions which control their production and loss, the water requirements of crops, protection of sandy soils from wind erosion, irrigation, and drainage, windmills as motors, the construction of silos and the preparation of silage, the construction and ventilation of farm buildings, besides other subjects too numerous to enumerate. Much of this work is embodied in permanent form in his books on *The Soil* (1895); *Irrigation and Drainage* (1899); *Physics of Agriculture* (1901); *Ventilation for Dwellings, Rural Schools, and Stables* (1908), and also in bulletins of the Wisconsin Experiment Station, publications of the United States Department of Agriculture and the

United States Geological Survey, encyclopedia articles, and periodical literature.

In 1901 Professor King was appointed chief of the Division of Soil Management of the Bureau of Soils, United States Department of Agriculture. In this position, which he held about three years, he devoted himself mainly to a study of crop yields and soil composition in relation to soil productivity, the results appearing in part in *Bulletin No. 26* of the Bureau of Soils.

After his retirement from this position he returned to his home in Madison, Wisconsin, and devoted himself largely to writing, with occasional trips to different parts of this country and abroad to study special agricultural problems and conditions. One especially noteworthy outcome of the latter phase of his activity is his book, *Farmers of Forty Centuries* (1911), which came from the press after his death. This book gives with a thoroughness, fidelity, and openmindedness rarely equalled, the results of observations made during a trip through China, Korea, and Japan, on the peculiarly efficient oriental methods of maintaining soil fertility.

Professor King was a tireless and productive worker and writer. His work is characterized by a thoroughness and finality which inspires confidence in its scientific reliability. In his tireless, patient, openminded pursuit of truth and uncompromising fidelity to it when discovered, he evinced in high degree the qualities of the true scientist. A colleague says — "In the accumulation of facts and detailed data from long-continued and carefully conducted investigations, Professor King's work was remarkable. In his mastery of details he had few equals. The thoroughness of his inves-

tigation was such that when he completed a piece of work it was finished; and his loyalty to scientific truth absolute. . . . But above and beyond all his work, we value most the spirit of the worker. . . . The discovery of truth is the joy of the scientist, and whether the discovery was made by himself or by another, the satisfaction seemed equally great to this man."

Professor King was especially ingenious in devising methods and apparatus for teaching and for experimental purposes. He was not only a master builder, but he fashioned efficient tools for the work. He possessed a rare combination of powers of keen and accurate observation, clear scientific analysis and interpretation, and understanding of the practical application of scientific truth to agricultural problems, as well as ability to present his ideas clearly. Hence, while he wrote much, he wrote well, leaving to us a rich heritage of scientific and practical knowledge in enduring form. No account, however brief, of the life and service of Professor King should fail to note the debt he owed, and always so gratefully acknowledged, to his devoted and accomplished wife for her active and intelligent assistance in much of his work.

Let Cyril G. Hopkins of Illinois repeat the words of tribute, which he wrote shortly after Professor King's death.

"I think there was no other man I knew so little and knew so well. In spite of his quiet mien and innate modesty, an hour's acquaintance with Professor King would reveal to the student of men that he was a man truly great.

"Less than a year ago he was in California, — one day examining the soils in the fields, and vineyards, and orange groves, and the next lecturing before that great soil conven-

tion at Los Angeles. The people of California will feel the vacancy in their next convention program. And he served not only in Wisconsin and California, but he was called to Illinois, to New York, and to Florida, to Arkansas, and to North Carolina.

"There were Johnson and Kedsie and Babcock and Hilgard, all eminent men, who helped to lay the foundation walls of our agricultural chemistry, upon whose superstructure a thousand common laborers are now at work; but when the science of agricultural physics is mentioned, we think first of all of F. H. King, for he laid that foundation, and for many years he was also the master workman upon the superstructures; yea, more — he developed methods of work and fashioned tools for the workmen: and he worked not only in agricultural physics, but he knew more of chemistry than most chemists.

"The true scientist has no opinions. Instead of opinions, he has knowledge, based upon facts; and in the accumulation of facts and detailed data from long-continued and carefully conducted investigations, Professor King's work was remarkable. In his mastery of details he had few equals: The thoroughness of his investigation was such that when he completed a piece of work it was finished and his loyalty to scientific truth absolute."

Cyril G. Hopkins

CYRIL G. HOPKINS

1866–1919

Cyril George Hopkins was born near Chatfield, Minnesota. He was still quite young when his family moved to Estaline, South Dakota, where he received his early education. He was graduated from the South Dakota Agricultural College and acquired his early scientific experience there as an assistant to Dr. Shepard, chemist of the experiment station. His post-graduate study was done at Cornell University where he received his Doctor's degree. For further training he went a few years later to the renowned German chemist, Tollens, at Göttingen.

Dr. Hopkins was appointed chemist of the Illinois Agricultural Experiment Station in 1894, and for twenty-five years he served that institution. A mere mention of his earlier scientific output, which was characterized by scrupulous care, bearing in all respects the stamp of reliability, is sufficient to prove its worth. It was during this time that he started the famous experiment in corn breeding in which it was proposed to change the composition of the grain by seed selection. This investigation has been continued through twenty-five generations of breeding with unbroken pedigree records, and the result has been a most remarkable response to the selection. Starting with a single variety of ordinary field corn, four different kinds have been created, one of which is now about twice as rich in protein as another, while

another strain now carries about five times as much oil as its corresponding relative.

In the year 1900, Dr. Hopkins was appointed to the chair of Agronomy, and it was at this time that he took up his great life work in the investigation of soils. With his characteristic vigor and thoroughness he went at once to the very fundamentals of soil science. It did not take him long to perceive that the usual soil analysis, as made by the acid extraction method so generally in vogue in that day, furnished little information of practical value. He soon adopted the plan of determining the total amounts of the various constituents upon the theory that this gives an invoice, as it were, of the total stock of plant foods that can possibly be drawn upon by the growing crops. Another innovation that Dr. Hopkins started was the practice of reporting analyses on the basis of elements rather than in terms of the acids or other compounds, a system that greatly simplified the presentation of fundamental facts to the layman.

In pursuing the investigations of the soils of Illinois, three main lines of procedure were inaugurated, namely, soil survey, field experiments, and pot culture. In the soil survey the various kinds or types of soil are classified and mapped in such a manner that, when the survey is complete, every landowner in the state will have a description of the soil on his farm, will know approximately its composition and will have at hand information relating to its maintenance and improvement.

Field experiments, serving for investigation as well as for demonstration, were undertaken on the more important types of soil. The number of these fields has increased until there are at present about forty distributed over the state of

Illinois. On these fields such problems as relate to plant food requirements, proper systems of crop rotation, drainage, prevention of soil erosion, subsoiling, and dynamiting are being investigated.

Dr. Hopkins viewed with serious alarm the evidence of waning productivity in the soils of the world, and he constantly held up as a warning the recurring famines of the Old World and the abandoned lands in our own country as indicative of the certain fate of this country if we do not give timely attention to the fertility of the soil. In his own words he regarded "the saving of the soil next in importance to the saving of the soul."

As the results to his investigations accumulated, Dr. Hopkins gradually evolved a philosophy or doctrine of soil fertility intended to apply to the normal soils of Illinois and of similar areas. His dominant idea was to provide a system of soil fertility that would result in a permanent agriculture. He recognized that the continual removal of crops from the land must finally lead to soil exhaustion unless the materials taken from the soil be restored. The common practice of the application of commercial fertilizers returns to the soil some of the necessary elements, but not in amounts proportionate to the quantities removed by crops, thus producing the effect of a stimulation rather than that of a sufficient supply of plant food. By restoring all of the elements to the soil somewhat in excess of the amounts in which they are removed by cropping, the soil is not only maintained in its natural fertility but is actually built up and made more productive. In order to accomplish this effect, the elements must be secured in the most economic form, which ordinarily calls for raw materials rather than those that are

treated or manufactured. Thus in ordinary cropping systems raw rock phosphate should be used, and the natural biological process of the soil will make the phosphorus available. Nitrogen should be secured from the air through the growth of legume crops. Potassium is abundant in most normal soils, and the problem of supplying this element is usually a matter of liberation from the natural minerals rather than the addition of potassium salts. In order that these natural biological processes may function properly, the soil must be kept supplied with an excess of basic material, and for this purpose natural crushed limestone serves best.

Near the close of the great World War a call to join the American Red Cross Relief Expedition to Greece met with an enthusiastic response, and Dr. Cyril G. Hopkins was officially commissioned a Major in charge of the agricultural rehabilitation of that devastated region. In the short year spent in this service he was able not only to diagnose to a large extent the causes of the low productivity of the soils of Greece, but also to suggest, and to some extent even to demonstrate, remedial measures. In his convincing manner he made a profound impression on the people of all classes from royalty to peasantry. Indeed, so highly was his work regarded that he was offered the opportunity of a permanent government appointment. As a token of this appreciation he was given a decoration of high order by the king of Greece.

Dr. Hopkins came to the end of his life in a most tragic manner. Upon completing his year's work in Greece he had set sail for home, but when about three days out of port he became violently ill. His condition was so serious that he

was taken from the ship at Gibraltar where he received the best care of the British Military Hospital. But the strain was too great. He died October 6, 1919.

The citizens of our republic regard this as heroic a sacrifice as any soldier could have made, for he went into the service fully cognizant of the privations and dangers involved in travel and work in that country so infested with malaria and other dread diseases. He laid down his life for the sake of humanity.

Charles E. Thorne

CHARLES E. THORNE

1846–

The childhood of Charles E. Thorne, the son of Elijah and Mary Thorne, was spent on a little backwoods farm in Greene County, Ohio, where he learned to do everything that was done on the farm during the period when the sickle, scythe and flail were giving place to modern machinery.

He had the good fortune to live in a neighborhood of plain Quaker farmer people who believed that the best schools were none too good for their children, and he was therefore able to go direct from a little country district school into the sophomore class at the Michigan Agricultural College, which was then just emerging from the woods in which it had been located a few years before.

At that time no suspicion had entered the mind of man that there could be any relation between mosquitoes and malaria, and in his rambles among the tamarack swamps that then abounded in that neighborhood, ostensibly botanizing but incidentally hunting wild raspberries, he became acquainted with the most vicious breed of mosquitoes that he had ever encountered, with the result that before the end of the first term he was compelled to return home.

In his brief stay at college he had become inoculated, not only with malaria, but with the idea of preparing himself to teach the relationship between modern science and agriculture, and after a year's recuperation he entered

Antioch College where he was permitted to select such studies as seemed likely to be most helpful in his chosen work. He was assisted in his choosing by Professors Edward Orton and Samuel C. Derby, later President of Ohio State University, and Professor William A. Anthony, under whom he was a class of one in chemistry and physics.

At the end of three terms of this work he abandoned his plans, for reasons which at that time seemed good and sufficient, and went to Kansas, expecting to make a farm home there, but a rainless summer destroyed his crops and sent him back to Ohio where two seasons of unceasing rain rusted the wheat and rotted the potatoes on his flat farm and left him under a heavy load of debt.

Meanwhile Professor Orton had become President of "Ohio Agricultural and Mechanical College," and upon his advice Mr. Thorne applied for the position of foreman of the College farm. Dr. Norton S. Townshend was then superintendent of the College farm, and Mr. Thorne's duties involved frequent consultation with the superintendent. Up to that time no experimental work had been conducted on the farm, an attempt to inaugurate such work having been defeated by lack of interest on the part of the preceding foreman. When Dr. Townshend found that Mr. Thorne desired to conduct such work, he entered heartily into his plans, helping with advice and suggestion drawn from his experience and extensive reading. From President Orton, also, Mr. Thorne received many helpful suggestions.

The Ohio College was reorganized in the spring of 1877, under the name it now bears, and the following year it was again reorganized.

With this second reorganization S. H. Ellis, whose work

is described in this book, and James B. Jamison, became members of the Board of Trustees of the Ohio State University, and being farmers, they with one other member constituted the Farm Committee of that Board. With their sympathetic coöperation the experimental work of the farm was expanded, but the amount of money available for such work was so small that very little could be accomplished. The chemical department of the University, the only department at that time which could have been of any assistance, showed no interest whatever.

In the autumn of 1881 Mr. Thorne was called to the Associate Editorship of *Farm and Fireside*. During the winter following, the law establishing the Ohio Agricultural Experiment Station was enacted, under the sponsorship of Colonel J. H. Brigham, then a member of the State Senate of Ohio.

In its original form the bill in Congress that in 1887 became the law since known as the "Hatch Act" made no provision for experiment stations established independently of the colleges of agriculture, of which there were several in operation at that time, that of Ohio being one. Colonel Brigham took an active part in securing the amendment to the bill under which the legislatures of the several states were authorized to designate the independent stations as the beneficiaries of this act.

This amendment was opposed by the trustees of the University who sent a committee to Washington to emphasize their protest, and, when the measure came before the State legislature, they made a determined effort to have the Hatch fund turned over to the University, but the legislature refused to accept the proposition. The directorship

of the Station was offered to Mr. Thorne who became director of the Ohio Agricultural Experiment Station in June, 1887, a position he held for a third of a century.

On December 8, 1887, a committee of the Board of Trustees of the University and the members of the Board of Control of the Experiment Station held a conference, at which it was agreed that all that portion of the University farm then used for agricultural purposes (about two hundred acres) including barns, farm houses, and equipment, should be turned over to the Experiment Station to be used for experiment purposes only, the professors in the University to have access at all times to the Station's records.

Under this agreement the Station took possession on the first Monday in April, 1888, with a staff consisting, in addition to the Director, of W. J. Green, Vice Director and Horticulturist; J. Fremont Hickman, Agriculturist; W. S. Devol, Botanist and Bursar; Clarence M. Weed, Entomologist; and Moses Craig, Meteorologist. Mr. Craig was a student in the University and gave part time to his work. Other students were employed in the manual work of the farm so far as practicable, and at a later date Dr. H. J. Detmers, a professor in the University, was employed for part time as veterinarian of the Station.

At the conference in December Ex-President Rutherford B. Hayes, then a member of the Board of Trustees of the University, had notified the Board of Control that the time must come when it would be necessary for the Station to find another location for its field work, because the lands of the University would be needed for other purposes. The rapid growth of the city around the University farm soon

confirmed this prediction. Permission was granted by the legislature for the removal of the Station, and in 1892 it was permanently located at its present home near Wooster in Wayne County. It should be understood, however, in this connection that while the Station proper was removed from the college, the institution is conducting on its own fields in Columbus at the present time many very valuable field tests and other forms of experimental and demonstration work.

When Mr. Thorne went to the Ohio Agricultural and Mechanical College as farm foreman, Dr. Townshend was expected to teach the applications to agriculture and horticulture of all the various branches of natural science, including agronomy, botany, chemistry, horticulture, animal husbandry, dairying, and veterinary anatomy, surgery, and medicine. Apparently this was not enough to occupy Dr. Townshend's time for he was also expected personally to superintend the operations of the college farm, and eleven years later, when Mr. Thorne went back to assume the directorship of the Experiment Station, in the spring of 1888, the University had graduated just two students in agriculture.

Nor were the conditions materially different in other institutions. At the University of Illinois Professor Morrow was occupying a position almost duplicating that of Dr. Townshend, and at a later date Mr. Thorne says he found Professor Roberts, of Cornell University, occupying a cheaply furnished upstairs back room, in one of the great buildings of that institution.

The disapproval of this course, intimated in the first establishment of the Experiment Station separate from the

University, and repeated in the almost unanimous designation of the Station as the beneficiary of the Hatch Act, together with the discussion consequent on the removal of the Station were very large factors in convincing the University authorities of the necessity for a broader vision in their support of its agricultural work. In the autumn of 1891 Professor Thomas F. Hunt was placed at the head of its "School of Agriculture." Young, strong, and able, Professor Hunt entered upon his work at a most propitious moment, and from that time forth this phase of the institution's work has had a very different standing.

The removal of the Station, says Mr. Thorne, thus contributed indirectly but powerfully to the growth of the College of Agriculture, which was dignified again with that name in 1896. This removal has also contributed directly to the cause of agricultural science in enabling the Station to conduct research in soil fertility on a broader scale than would have been possible had it remained on the college farm. The growth of the equipment of the College of Agriculture itself, in land and buildings, has been in considerable measure due to the efficient management of the college by its dean and his assistants and also to the greater faith in the possibilities of successfully combining science with practice in agriculture as demonstrated by the Station's field experiments, made on soils selected especially because of their adaptation to such work, and so scattered over the State as to bring under observation its principal soil formations.

The Ohio Station was among the first stations in the United States to insist that a correct knowledge of the soil can not be obtained from field studies limited to a single

farm, or from any number of pot experiments, and state after state is adopting this Station's method of soil investigation.

By this method, Charles Thorne explained to one of the authors of this book, the Ohio Station has been able to furnish a fund of information to the teachers in the College of Agriculture and opportunities for observation and study to the students in that College that would have been absolutely impossible had the Station remained on the college farm, or had it limited its work to any one farm in any part of the state.

The Ohio Agricultural Experiment Station began its existence in the spring of 1882, a tenant at will on the premises of the Ohio State University, with an appropriation of $3000 from the State treasury and a scientific staff of four members. The appropriation was increased to $5000 for 1883, and remained at that average until the spring of 1888, when it was reorganized under the Hatch Act with an appropriation of $15,000 annually from the National treasury. The scientific staff was increased to seven, and remained at that average for eight years.

With the passage of the Hatch Act the State withdrew its appropriations, but these were renewed with an item of $2000 in 1890 and $3000 in 1891.

On the removal of the Station the State legislature began to take a greater interest in its affairs. The Supreme Court having declared unconstitutional the law under which Wayne County had furnished $85,000 to secure the Station's location, the State refunded this money to the bondholders and began making appropriations for the erection of buildings, the purchase of live stock and other purposes.

In 1886 the scientific staff was increased to nine. About 1900 the orchard and nursery inspection work was started by the Station, and the work of the State Live Stock Commission was transferred to the Station.

In 1901 the Station was reorganized, and at its request all inspection and control work was transferred to the State Department of Agriculture, leaving the Station free to devote its entire energies to scientific research in Agriculture.

From 1892 to 1905 the State's appropriations to the Station averaged $26,256 annually. The appropriation for 1906 was $69,700, and the average for the ten years, 1906–1915 was $141,715.

During this period the scientific staff increased from thirteen to sixty-two, and the Station's work was spread over the State by the establishment of nine county experiment farms, additional to the three district experiment farms that had been previously established under lease and were later purchased.

For the five years, 1916–1920, the State's appropriations averaged $279,790, and during this period the State has adopted a definite policy of State forestry, the execution of which is lodged with the Experiment Station. These appropriations are all additional to the amounts received from the National treasury.

The Station began its existence as a tenant with the use of about thirty acres of land for which it turned over all the produce as rental, and had two or three rooms in one of the University buildings. It now owns nearly 2900 acres of land (including one thousand seven hundred acres of forest) with buildings and equipment costing nearly a quarter of a million dollars. In its field work more than

3000 permanent plots of one-fortieth to one-tenth acre each, located in fourteen counties, are given to the study of soil fertility, and approximately half as many more to cultural problems, and two hundred to two hundred and fifty people are employed in its scientific and laboring staff.

These increases in resources indicate that the people of the State, acting through their representatives in the legislature, have believed that the Station was doing a useful work.

The leading features of the Station's work have been the study of orchard problems, including control of insects and diseases and renewal of fertility, in which Mr. Green has been the leader, supported by Messrs. Selby, Gossard, Ballou, and others, the improvement of varieties of cereals, in which Mr. Williams has done invaluable work; and the study of problems relating to the maintenance of soil fertility, in which Mr. Thorne has had the close coöperation of Messrs. Williams, Ames, and Green.

The Station in 1921 passed under the government of a Board of Control, of which the Trustees of the Ohio State University constitute a majority.

The trustees of the Ohio State University who constitute the majority on the Board of Control for the Ohio Agricultural Experiment Station are men of broad vision. For this reason it is not likely that any narrow policy toward the advancement of the best interests of the Ohio Agricultural Station will be permitted.

The attitude of the people of the State of Ohio toward education in Agriculture has become so clarified and broadened in recent years that the Board of Control of the Ohio Station will be strongly supported on all aggressive policies

which they inaugurate for the advancement of both the College of Agriculture at Columbus and the Ohio Agricultural Experiment Station at Wooster.

If, during the third of a century of Mr. Thorne's directorship of the Ohio Agricultural Experiment Station, there was any accomplishment of value to humanity, he informed the authors it was due, first, to the autonomy given to the Station by the people of the State through their representatives in the legislature, and under the autonomy, to the sympathetic support of the members of the governing boards of the Station and the agricultural press of the State, and to the faithful and loyal coöperation of the great majority of those who have been assisted in the direction and execution of the Station's work.

The Ohio Station under the management of Charles Thorne always enjoyed the full confidence of all Ohio citizens. He resigned the directorship of the Station but continued to act as chief in the soil fertility work. He has been a popular lecturer at Farmers' Institutes and has written many valuable bulletins upon the maintenance of soil fertility. He is also the author of a book entitled *Farm Manures*. He was president of the American Society of Agronomy in 1915 and president of the Society for Promotion of Agricultural Science in 1916 and president of the Association of American Agricultural Colleges and Experiment Stations during the same year.

ADMINISTRATORS OF AGRICULTURE

WILLIAM ARNON HENRY

1850–

William Arnon Henry was born at Norwalk, Huron County, Ohio. His early life was spent in the country. He attended the Ohio Wesleyan University, Delaware, Ohio. He was principal of the high school at New Haven, Indiana for two years, and of the high school at Boulder, Colorado, three years.

In 1876 he entered Cornell University, being graduated in June, 1880, with the degree of Bachelor of Agriculture. While at Cornell, he served as student instructor in botany, and during the summer of 1879 was with Professor C. V. Riley on the United States Entomological Commission, Washington, D. C.

Upon his graduation he was elected Professor of Botany and Agriculture, University of Wisconsin, and in 1881 and 1882 he conducted researches in the production of sugar from amber cane and in the ensilage of fodders.

In 1883 Governor Rusk in his annual message called attention to the value of the work done by the agricultural department of the University, mentioning Professor Henry by name, and recommended the establishment of an experiment station at the University, which was created the same year by the Regents. In 1883 his title was made Professor of Agriculture.

In 1887 the Hatch Act was passed by Congress, whereby the general government granted $15,000 annually to each

state for agricultural research. Professor Henry was appointed Director of the Experiment Station that year.

In 1891 he was appointed Dean of the College of Agriculture, his title being "Dean of the College of Agriculture and Director of the Agricultural Experiment Station, Professor of Agriculture."

Under his directorship there were published to July, 1907, twenty-three annual reports of the Agricultural Experiment Station, of not less than fifteen thousand copies each, aggregating 6605 pages of printed matter, and one hundred and fifty-three bulletins, in editions of from five to fifty thousand copies, aggregating 5058 printed pages.

During the year 1906–1907, the Experiment Station issued an annual report of three hundred and twenty-one pages, fifteen thousand copies; sixteen bulletins in editions ranging from ten thousand to fifty thousand each, embracing six hundred and forty-three pages of printed matter. During the year the Station issued altogether over twenty million pages of printed matter.

In 1895, by direction of the legislature, with his associates, Professor Henry prepared *Northern Wisconsin; A Handbook for the Homeseeker*, a volume of two hundred pages, with numerous illustrations. The edition, printed by the state, numbered fifty thousand copies.

In 1898, he published *Feeds and Feeding; A Handbook for the Student and Stockman*, a volume of six hundred and seventy pages. This book passed through nine editions, aggregating over thirty thousand copies. In October, 1910, the tenth edition, five thousand copies, appeared. The book was entirely rewritten for this revision. In April, 1911, the eleventh edition was printed. *Feeds and Feeding* is now

William Arnon Henry

used as a textbook in nearly every agricultural and veterinary college in America.

For many years he served on the editorial staff of the *Breeders' Gazette*, Chicago, and was the founder of the "Feeders' Corner" in that paper. He likewise served for many years on the editorial staff of *Hoard's Dairyman*, Fort Atkinson.

In 1902 he lectured on animal nutrition in the summer school, University of California. In June, 1904, he was granted the degree of Doctor of Agriculture by the University of Illinois, and in July, 1904, the degree of Doctor of Science by the University of Vermont, at its centennial celebration. In May, 1907, he received the honorary degree of Doctor of Science by the Michigan Agricultural College at its semi-centennial celebration.

He was married, July 11, 1881, to Clara Roxanna Taylor, of Oakfield, New York. His wife died at the Dean's House, Madison, Wisconsin, July 5, 1904, and was buried in the Oakfield, New York, cemetery.

When Dean Henry took charge of the Agricultural College in 1880, there were no agricultural students in attendance. In the fall of 1885 there was issued a circular announcing "The new course in Agriculture at the State University." This is now known as the Short Course in Agriculture. It began January 7, 1886, with an attendance of nineteen students, and was the first agricultural short course successfully established in this country.

In 1890 the first dairy course in America was established by the Agricultural College, with two students. In 1904, the Farmers' Course was established, with a registration of one hundred and seventy-five members.

For the college year 1906 1907 the attendance in the College of Agriculture was as follows:

Short Course	327
Dairy Course	164
Farmers' Course	606
Long Course	142
Graduate Course	8
Total	1247

During Professor Henry's administration the University farm was increased in area by about three hundred acres.

When he took charge, there was a small farmhouse, two ordinary barns, a little live stock, a few tools, and a few armfuls of books on Agriculture; when he retired, buildings of the College of Agriculture represented an expenditure of about $400,000 and the personal property of the College inventoried nearly $150,000. The live stock inventoried over $20,000.

The Agricultural College Library always received his first attention and care. On his retirement it numbered over eight thousand bound volumes, all on agriculture. It is without an equal in the West.

In the early years, Professor Henry personally carried on much research work. The most important of these studies were: The effects of protein, carbohydrates, and mineral matter in feeds on the body of the growing pig; the relative values of corn and corn meal for feeding swine; the value of cooked and uncooked feed for swine; the value of skim milk, middlings, barley, potatoes, and other feeds for swine. Because of increased executive duties, he was able to carry on but little research work during the latter years.

Professor Henry resigned the office of Director June 30, 1907. He was appointed Emeritus Professor of Agriculture, the appointment to take effect July 1, 1907, and in September, 1909, was placed on the Carnegie pension roll. Of late he has spent much of his time on the Connecticut farm, living in intimate relation with the flowers and trees he loves so well.

Referring to his resignation in April, 1907, *Farm, Stock, and Home* said:

"It is with deep regret that we write of the resignation of W. A. Henry, Dean of the Agricultural College of the University of Wisconsin, and Director of the Wisconsin Experiment Station. For nearly three decades he has been recognized as the most prominent agricultural educator and experimenter. His chief characteristics are his devotion to the interests of the tiller of the soil, his advanced ideas, his appreciation of all branches of agriculture, his unbounded enthusiasm, and the remarkable energy with which he prosecuted the work of building up the agricultural department of the University of Wisconsin."

On his seventieth birthday, June 16, 1920, *The Wisconsin Agriculturist* said:

"The founding and building of the Agricultural College and the Experiment Station; the proving to the state and to its legislative representatives the necessity, not only for agricultural education, but for higher education in general; the active part taken in securing recognition of agricultural research by Congress; the creation of the Short Course in Agriculture which marked an innovation in methods of agricultural instruction; and the active support which he rendered the state in the popularization of agricultural

research through the medium of the Farmers' Institutes are the notable achievements in his career which now stand out in clear relief, and which will always be associated with his name, not only in the development of agriculture in Wisconsin, but throughout the nation."

Whitman H. Jordan

WHITMAN H. JORDAN

1851–

When at the age of forty-five Dr. Jordan took up his work at Geneva, New York, as Director of the Experiment Station, he found that a very small beginning had been made. Investigations were being conducted under the heads of chemical and horticultural work. Since that time, one department after another has been segregated until the institution has clearly defined departments of animal husbandry, entomology, botany, horticulture, bacteriology, chemistry, and agronomy, as well as several specialized workers in other fields on its staff. On July 1, 1896, the staff of the station numbered fifteen persons besides the director; now there are over 500, of whom 477 are scientific workers. Materially the quarter century has seen a vast number of changes and improvements. When Dr. Jordan went to Geneva, the station's plant consisted of the original farm of one hundred and thirty acres, the old mansion house, which provided a residence for the director as well as his office, the chemical laboratory, five residences, three barns, and a cold storage house. The first important improvement under Dr. Jordan's régime was the erection in 1898 of the dairy building at a cost of $41,000. This was followed by the erection of the director's house in 1900 and the remodeling, in the following year, of the old mansion house into quarters for executive offices and library. Following the fire of May 7, 1902, the barns were rebuilt. Besides these buildings dwellings

have been erected for staff members, a poultry plant has been provided, a forcing house constructed, and numerous other additions to the institution's equipment have been made. In 1911 the Crittenden Farm, joining the station grounds on the northwest, was purchased, adding eighty-seven acres.

Of all material improvements to the station none stands out as a greater monument to Dr. Jordan than the administration building which bears his name. This building is the direct result of Dr. Jordan's perseverance. Before the money was finally made available, the proposition was presented to ten legislatures and was vetoed seven times by six different governors. Finally on May 15, 1916, when the bill appropriating $100,000 for the building was approved by the governor of the state, it was doubtless one of the happiest moments of Dr. Jordan's life. On this occasion he sent from Albany to Mrs. Jordan the happy telegram: "Governor signed the bill. I have the pen." The pen now has its place in the building as one of the historic relics of the institution. When the building came to be dedicated on August 31, 1918, due recognition was made of Dr. Jordan's work in behalf of the building. In connection with the exercises, Charles S. Wilson, then Commissioner of Agriculture and president of the Board of Control, announced that the Board had decided to name the Building "Jordan Hall" in honor of the director.

In his conduct of the institution Dr. Jordan pursued a simple and uniform policy. He held that the function of an experiment station is agricultural research and not extension work. He believed that such an institution should devote itself to a study of fundamental problems relating

to agriculture, rather than to an economic application of scientific knowledge to practical agriculture. Adhering to this principle, Dr. Jordan held the work of the station largely to investigations of the severer sort and left the application of such truths as the station has established to other agencies. To maintain this policy was not always an easy matter. Organizations and influential individuals almost continuously besieged the station to send its men forth on what might be termed missions of practical work. To all such entreaties Dr. Jordan turned a deaf ear, holding that if the investigators were required to tour the state in the interest of this or that agricultural practice, little or nothing would be accomplished that would be of lasting value to agriculture, the real end for which the station was established.

This policy has had a decided influence upon the Geneva station and has given it a high and recognized position among the institutions of agricultural research in the country. While many similar institutions in other states have been devoting their funds and energies to dealing with the immediately practical side of farm problems, the Geneva station has been quietly working to solve fundamental problems, and the results have been of lasting importance. This being the case, a considerable number of able young men upon the threshold of a scientific career have availed themselves of an opportunity to go to Geneva, rather than attend other institutions, even though the choice involved a financial sacrifice.

Another fact that has made the Experiment Station attractive to young scientists is the recent action establishing reciprocal relations with the State College of Agriculture. Under this arrangement investigators at the Experiment

Station may receive academic credit for work done at the station and have work count toward a degree from Cornell University. This relation has also made it possible for the two institutions to coöperate on research problems and has brought the faculty of the college and the staff of the station into closer fellowship.

Dr. Jordan had an important influence upon the general agricultural policy of the state. Throughout his term of office he spoke annually at the important agricultural meetings and was continuously active in the state societies. In 1908 he was president of the State Dairymen's Society, and in 1920 of the State Agricultural Society. His influence on agriculture during his residence in Geneva was not confined to New York state, for he also played an important part in federal agricultural circles. For sixteen years he was a member of the executive committee of the American Association of Agricultural Colleges and Experiment Stations. During this time he served the Association as its president for one year and represented this important body on a number of occasions. Through this agency Dr. Jordan had an important influence upon national agricultural policy, for it has been to this group of men, representing the agricultural institutions in each of the states, that the members of Congress, cabinet officials, and even presidents have turned for advice in framing agricultural legislation and policies. In this connection Dr. Jordan was frequently called to Washington to give his opinion and advice.

During the war Dr. Jordan served as chairman of the Federal Milk Commission for the Middle States and in this capacity had the difficult and perplexing problem of

establishing prices of milk for both the producer and the consumer. When the Milk Commission ceased its work in 1918, Dr. Jordan was called upon to make extensive lecture tours over the eastern part of the country to present the viewpoint of the Food Administration upon food conservation and other matters that indirectly concerned agriculture.

Besides numerous station bulletins Dr. Jordan wrote two books, one *The Feeding of Animals*, the other, *The Principles of Human Nutrition*.

Upon his retirement from active service at Geneva, he moved to Orono, Maine. He had been director of the Maine State Agricultural Experiment Station there for eleven years before taking up the work at Geneva. One of his friends upon his departure from New York said, "Mr. Jordan has gone home." He had many friends in New York who regretted his departure from the Empire State. In this connection we feel it a fitting courtesy to Dr. Jordan to include the resolutions of the faculty of the New York State College of Agriculture upon his retirement as Director of the New York Agricultural Experiment Station, 1896–1921, and Professor of Animal Nutrition in the New York State College of Agriculture, 1920–1921.

"On the occasion of the retirement of Dr. Whitman Howard Jordan from the professorship of animal nutrition in Cornell University and from the directorship of the New York Agricultural Experiment Station at Geneva, the members of this faculty desire to record their appreciation of the inestimable service which Professor Jordan has rendered to science and to the scientific agriculture of the State and of the Nation.

"Professor Jordan assumed the directorship of the experiment station in 1896, a critical time for agriculture and for new experiment stations. He brought to his work true scientific training, gained as an undergraduate student at the University of Maine, as a post-graduate student at Cornell University under the guidance of Professor Caldwell,

Jordan Hall, so named in honor of Whitman H. Jordan.

and as an assistant to Dr. Atwater at the Connecticut Agricultural Experiment Station; and long experience as a teacher of agriculture and agricultural chemistry at the University of Maine and at the Pennsylvania State College, and as director of the Maine Agricultural Experiment Station. With this wealth of training and experience, in addition to his high scientific ideals, his indomitable courage, his unflagging zeal for truth, his sound judgment in the selection of associates, and his unswerving loyalty to the best

interests of agriculture, he has made a profound and lasting impression on the agriculture of this State.

"The outstanding feature of his long service in the interest of agriculture has been his strict adherence to the dictates of science without regard to popular esteem or favor. Strong as the temptation has been for an administrator to popularize the work of his institution at the expense of its research, Professor Jordan, in his administration of the station, has held strictly to the original purpose and object of the institution uninfluenced by considerations of popular favor. Under his wise and capable administration, the New York Agricultural Experiment Station has attained a leading position among the agricultural experiment stations of the world.

"Professor Jordan's connection with this College as professor of animal nutrition dates only from June 22, 1920, but his interest in the institution and his hearty and cordial coöperation have extended through all the twenty-five years that he has been director of the experiment station at Geneva. Accordingly there has always existed between these two institutions such close and gratifying coöperation in the prosecution of investigation and research that their work has ever been supplementary, and unnecessary duplication of effort has been avoided.

"In spite of all the multiplicity of duties which naturally come to an outstanding figure in agriculture, Professor Jordan has always found time to continue his own scholarly work in animal nutrition and to advise critically with members of his staff on a wide variety of highly technical subjects. His keenly analytical mind, his sound judgment, his unusual administrative ability, and, above all, his lofty personal

ideals and breadth of vision, have endeared him to his colleagues and associates. He has richly earned the relief which retirement from active service brings, and we, his colleagues, wish him many years in which to enjoy the privileges of the contemplative life which is now his."

ISAAC PHILLIPS ROBERTS

1833–

Isaac Phillips Roberts was born in Seneca County, New York, of native American parents. His father, Aaron Phillips Roberts, emigrated from Harbortown, New Jersey, to Central New York about 1816 and in 1820 married Elizabeth Burroughs, the daughter of Joseph Burroughs, who had come from the same neighborhood in New Jersey in 1812. Isaac Roberts was educated in the district school of the town of Varick and at the Seneca Falls Academy. In 1875 he received from the Iowa State Agricultural College the degree of Master of Agriculture.

In early manhood he went from East Varick to La Porte, Indiana, where he practised the trade of carpenter in the summer and taught school during the winter until he was able to buy a farm. In 1857 he married at Kingsbury, Indiana, Margaret Jane Marr, the daughter of a prosperous farmer, and in 1862 emigrated with his wife and daughter in a pioneer wagon from Indiana to Mount Pleasant, Iowa, where he settled down to farming.

In 1869 he was called to the position of Superintendent of the Farm and Secretary of the Board of Trustees of the Iowa Agricultural College at Ames and shortly afterward was made Professor of Agriculture. In 1873 he accepted a similar position at Cornell University, Ithaca, New York, and a little later was made Dean of the Faculty of Agriculture and Director of the Experiment Station. During the thirty years of his service at Cornell he wrote, as

Associate Editor on the staff of *The Country Gentleman*, about fourteen hundred short articles on agricultural subjects, chiefly in answer to queries. He published also four scientific books, *The Fertility of the Land*, which has gone into several editions and is still in general use as a college textbook; *The Farmer's Business Handbook*, of which a second edition has recently been published; and *The Farmstead and the Horse*.

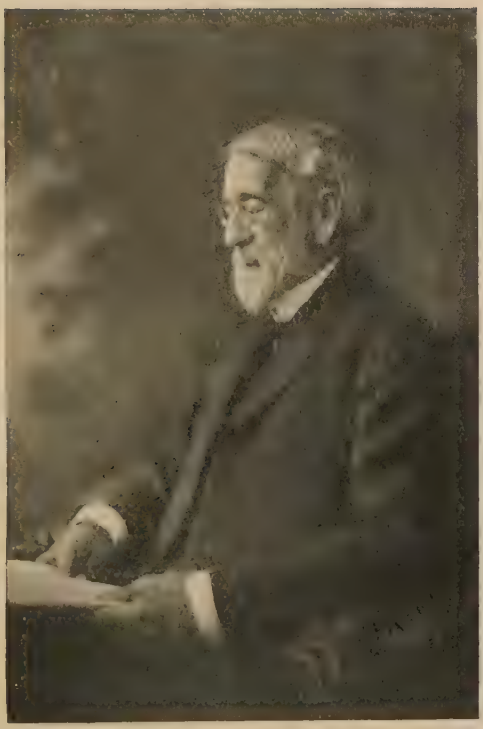
At the age of seventy he retired with the title of Professor Emeritus, receiving an honorary pension from the Carnegie Foundation for his services; and settled in Palo Alto, California. After the death of his wife in December, 1913, he went to live with his youngest son at Fresno, California, where he spends his winters.

These facts may be found in greater detail in his own *Autobiography of a Farm Boy*.

Professor L. H. Bailey in a statement published in Mr. Roberts autobiography says in part:

"For thirty years Professor Roberts led the work in agriculture at Cornell University. These were the eventful and triumphant years of 1873 to 1903. They began in doubt and with small things, but they were large with faith. He developed one of the best institutions of its kind.

"Only ten or eleven years have elapsed since the passage of the Land Grant Act, at which time instruction in agriculture was given a national sanction. A few colleges had made the effort to organize the subject into teaching form and to collect the equipment and develop the farms that were necessary to the new enterprise. Even Michigan, the oldest of the existing North American colleges of agriculture, had been under way only sixteen years. Cornell had



Isaac Phillips Roberts

given instruction five years. From the first, agriculture had had its appointed place in the institution; but the work was not really established until Professor Roberts came. He came from a farm and with the traditions of farming. He had had experience in the new institution in Iowa. He put himself to the task bravely, as one sets out to plow and to cultivate a prairie domain the boundaries of which are seen, and the promise of which is known, but to the few.

"For thirty years Professor Roberts and his associates stood for agriculture, always for agriculture — not for natural science under the name of agriculture nor for some pleasant combination of studies that would satisfy the law. In an eastern university, with the great tide of emigration sweeping past him to the West, with decreasing values, with hindering traditions, he stood, — stood like a prophet.

"It is this courage, this steadfastness in the determination to hold the field for agriculture, that grows larger in my estimation as the years go by. I speak of his work in the past tense, for I too look backward; but I am glad that he is still keen to follow the result of his labors. It was not then a day for erudition, or for high technical scholarship, but a time for clear faith, homely and direct relations with the people, wisdom in giving advice. From the first years that I knew him he was a philosopher and a forecaster, always practical, always driving home the point, always with his feet squarely on the ground.

"Yet, with all his knowledge of the fields, Professor Roberts was singularly sympathetic with every range of science teaching, with every indoor laboratory, with good work in every department of knowledge. Unlike many practical men, he did not insist that all science should have

immediate application. He saw the educational result. So he gathered about him many specialists, gave them every facility and equipment he could secure, and left them with great freedom.

"His hold on the students and on the people of the state was remarkable. His talks and addresses always had practical wisdom combined with vision, he was patient and self-contained under criticism, he made friends and he held them. To this day all over New York his students hold him in affection, and old men with broken step inquire of him with tenderness."

Dr. Roberts was one of the first men to stand heroically on the advance line for a saner, more scientific, and more profitable use of America's stupendous land inheritance. His grandfather had cut the great beech and maple trees, then abundant in central New York State, cut them into logging lengths, piled and burned them, gathered and leached the ashes and boiled the lye down to a crude potash, loaded it into a skiff and rowed fifty miles to Syracuse where he exchanged it for two hundred pounds of salt.

Dr. Roberts has brilliantly magnified the progressive steps in harvesting wheat from the days when his father used a hand sickle and when he himself used a hand cradle, to the present time when a great tractor-harvester sweeps along in a floating cloud of dust, discharging a pile of straw here and a bundle of filled sacks there, reaping and sacking five hundred bushels of wheat or more in a day.

He has always had a message for grain raisers. He uses the grain-investment of dairy farmers as an inspiring illustration. Nothing has been as illuminating in the promotion of better grain raising as Dr. Robert's presentation

of the parallel between the universal and uniform advancement of the dairy interest and the too general lack of science in the preparation of the soil, in the selection of seed, in the harvesting and marketing of wheat.

He uses as his glowing slogan: "Go to the Dairyman, thou tired Grain-raiser, and learn economic wisdom. The yield of milk and butter fats in many dairies has been increased two hundred per cent, and the limit is not yet." Dairies are now open all the year round where once they were unproductive for a third of a year. The dairyman now keeps a strict account with his de-horned, tamed, working partner. He weighs out her concentrated foods and keeps account of the results of this food. Only a few dairymen linger behind and are still trying to produce milk from hay and straw.

Few men are appreciated during their lifetime. Professor Roberts' ninetieth birthday was the occasion for such heartfelt expressions of congratulation and goodwill that there can be no doubt of the recognition of Dr. Roberts' great services. Dr. Roberts has been a leader among those who have magnified the science and art of conserving the productive power of the land. He says, "If any grain-raiser would treat his land as well as many a dairyman treats his cows, the yield would jump three or four fold. Treat your partner, the land, liberally, and it will reward you liberally."

The oldest men in agriculture who know the field best say that Dr. Isaac Phillips Roberts is rightfully called "The Father of Agricultural Science."

WILLIAM ISAAC CHAMBERLAIN
1837–1920

William Isaac Chamberlain was born in Sharon, Litchfield County, Connecticut, but the family moved to Hudson, Ohio, when William was but a year old. He lived and worked on the farm until sixteen years old. He was graduated in 1859 with high standing from Western Reserve College, Hudson, Ohio, now Western Reserve University, Cleveland, Ohio. For ten years he taught Greek and Latin, chiefly in his Alma Mater. For two years, 1862–63, he was superintendent of schools at Cuyahoga Falls, Ohio. Here his health was greatly impaired, so under the doctor's advice he bought his father's farm which he retained and managed until 1912. He began writing for the agricultural press in 1865, contributing to *American Agriculturist*, *Country Gentleman*, *Rural New Yorker* and *Ohio Farmer*.

In May, 1880, The Ohio State Board of Agriculture elected William Chamberlain its secretary and asked him to present detailed plans for enlarging the scope of its work, and for publishing the annual agricultural statistics and proceedings of the Board. On his detailed report the Board instructed him to undertake the following lines of work: (1) Monthly reports of the condition of crops in concert, with a few other states and with the United States Department of Agriculture. (2) The inspection and control of commercial fertilizers (under a new law written and its passage obtained by him, based on the laws of Connecticut

and New Jersey, the only states up to that date that had attempted fertilizer control). (3) The establishment and management of county and local Farmers' Institutes. The fully developed plan for these, substantially as now conducted in Ohio and nearly all the states of the Union, was submitted by him and adopted by the Board in September, 1880. For six years thereafter he conducted the institutes and managed the other new work as suggested by himself.

Dr. Chamberlain may justly be called "The Originator of the County Farmers' Institute Idea." For some time Michigan had held four or five Institutes each year, managed by the State Agricultural College with its professors as lecturers and instructors, and the wealthier and more progressive farmers had attended. Dr. Chamberlain's idea, adopted by the Board, was that if four or five Institutes were good for the whole state, then four or five in each county would be better, and that they be planned not merely for instruction by a few college professors, but for instructive talks on agricultural principles and methods by some of our most successful farmers, and conference and discussion among the farmers present.

Ohio was unquestionably the first in this extended local work in all the counties. A few years later Wisconsin began a similar work, based upon extended correspondence between W. H. Morrison, the Wisconsin Institute leader, and W. I. Chamberlain.

That the State Fair was not neglected because of this new work is clear from the fact that its average annual receipts for the six years of his secretaryship were $31,374 as compared with $20,881, the average for the six years immediately preceding, an increase of over fifty per cent.

William Isaac Chamberlain

Also from the fact that in 1883, on his own advice and under the Board's instructions, he selected the present Fair Grounds and quietly got options from the owners.

In May, 1886, when the new grounds were practically finished and two Fairs had been held on them, and when all the other new work of the Board was firmly established, an unexpected call to the presidency of the Iowa State College of Agriculture and Mechanic Arts was accepted by Dr. Chamberlain, who left L. N. Bonham as his successor.

Internal and political dissensions at the Iowa College had unseated two presidents in the three years preceding. After four years, 1886–90, of quiet and successful administration, Mr. Chamberlain returned to Ohio to the direct management of his productive dairy and orchard farm, and to the associate editorship of *The Ohio Farmer*.

He was honored by the following degrees: an A. B. from Western Reserve College in 1859; A. M., Western Reserve College, 1862; LL.D., Rutgers College, N. J., 1886; LL.D., Ohio State University, 1887. He died in 1920, soon after his wife's death. His son, Professor Joseph S. Chamberlain, of Massachusetts Agricultural College, Amherst, Massachusetts, and his daughter, Mrs. H. H. Hosford of Cleveland, Ohio, survive him.

From 1891 to 1908 Dr. Chamberlain was joint editor of *The Ohio Farmer* of Cleveland. From 1908 to 1919 he was Associate Editor of *The National Stockman and Farmer*. From September, 1919, to the time of his death Dr. Chamberlain was Corresponding Editor of *The Ohio Farmer*.

When he took over his father's farm, it was rather run down and unproductive, with a heavy clay soil. After struggling for a few years with sheep and a few cows, he began

to put in practice one of his fundamental principles: — to do things on a large enough scale to be profitable or not to do them at all. As a result he gave up sheep and built up as good a dairy herd as was then possible. After studying his particular soil, he began soon afterwards the systematic tile drainage of the entire farm. This he kept at for perhaps the next twenty or more years until every acre of tillable land was thoroughly and scientifically underlaid with drains. He believed that the only way to get money from the soil was to invest money in the soil. Believing that his location and soil were well adapted to the growing of apples, he began to set out an orchard, which at the time of his retirement from the farm consisted of seventeen acres of bearing trees and eight acres of young trees. To this orchard he gave his most thoughtful study and care, cultivating it as he would a field and consistently spraying according to the latest scientific practice. He was one of the first farmers of the section to begin the growing of wheat and always grew it on as large a scale as his farm would permit.

Another of his principles was to produce the finest product possible and then to sell it direct to the consumer. His maple syrup was made in the most improved type of evaporator and then sold in mail-order lots to private consumers all over the United States. The same practice was followed with his apples, while wheat and potatoes, especially in late years, were grown from selected varieties and sold as seed to individual buyers.

Perhaps the most thorough study which he gave to anything on the farm was to the use of manure and commercial fertilizers. His farm was a practical experiment

station in this respect, and his plots of varieties of wheat and potatoes under different fertilizer treatment were most instructive and convincing.

His character was a combination of the successful business man and the scientific investigator. He believed in scientific agriculture and he believed that it paid if conducted on both scientific and business principles. His college training was of the classical type, and his love of the classics remained with him always, so that to the end of his life he read his Greek Testament in church. His trained mind readily grasped the growing application of science to agriculture, and he was a constant student of geology and chemistry. He often expressed a regret that in his college days science was so little studied, and he envied the present generation their opportunity to study the sciences underlying agriculture. His constant study of his own problems and his practical experiments on his farm kept him continually in supply of material which he contributed to the agricultural papers as long as he lived, and which he used in Farmers' Institute lectures in every county of Ohio and in many other states. He believed in doing everything on the farm as well as in life in the best way possible after a careful study of each problem followed by the sharing of his knowledge and experience with others. He was a leader because he was a student, because he was practical, because he associated with leaders, and because he gave freely of all that he received.

ALFRED CHARLES TRUE

1853–

Alfred Charles True was born at Middletown, Connecticut, the son of Charles Kittredge True, D.D., then a professor in Wesleyan University.

His boyhood was spent in both country and city, in Connecticut, New York, and Massachusetts. He was prepared for college at the old Boston Latin School, where on graduation he received one of the silver medals for which Benjamin Franklin left a fund to the City of Boston. He was graduated with honors at Wesleyan University in 1873, receiving the degree of Bachelor of Arts, to which was added in 1906 the honorary degree of Doctor of Science.

For two years he was principal of the High School at Essex, New York, and for seven years a teacher in the State Normal school at Westfield, Massachusetts. At both of these schools there were many students who came from farms and either returned to them or became teachers in rural schools. Mr. True was, therefore, led to study carefully the problems of rural education. His vacations during this period and for many years thereafter were spent on farms or in places where he had close contact with rural people and agricultural operations.

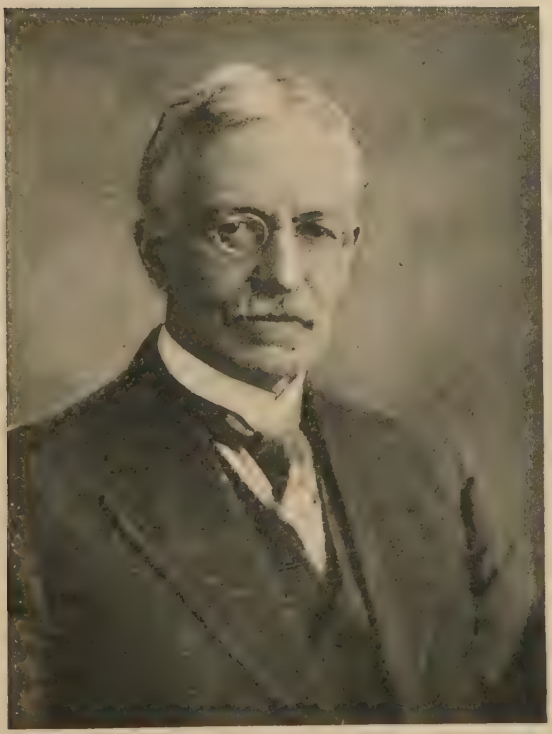
From 1882 to 1884 he pursued graduate studies at Harvard University, and for four years thereafter he was a member of the faculty of Wesleyan University, where he

was associated with Professor W. O. Atwater, the famous agricultural chemist and director of the first agricultural experiment station in the United States.

In the fall of 1888 he was invited by Professor Atwater, then Director of the newly established Office of Experiment Stations in the United States Department of Agriculture, to prepare a brief history of agricultural education and research in the United States to accompany the Government Exhibit at the Paris Exposition of 1889.

Believing that the Government's relations with the growing movement for agricultural education and research offered the opportunity for a useful career, he took a Civil Service examination for an editorial position in the Office of Experiment Stations, to which he was appointed in March, 1889. He thus became closely identified with the establishment of a series of Farmers' *Bulletins* and the Experiment Station *Record*, of which journal he was for a number of years the managing editor. In 1891 he became Assistant Director of the Office of Experiment Stations and in 1893 its Director, holding this position until 1915.

While primarily engaged in work relating to the experiment stations, he continued efforts to promote agricultural education in a broad way, contributing articles on this subject to Department and other publications, consulting with Boards of Trustees and agricultural college officers concerning the organization and work of their institutions, and carrying on propaganda for the introduction of agriculture into the lower schools. Largely through his efforts Congress was persuaded to establish in the Office of Experiment Stations a division for the promotion of agricultural education which is still continuing work.



Alfred Charles True

Since 1895 he has been a member, and for many years the chairman, of a standing committee on agricultural instruction of the Association of Land-Grant Colleges. The annual reports of this committee, now enlarged to include Home Economics and Mechanic Arts, have been a considerable factor in the development of agricultural education in this country.

He was dean of the first Graduate School of Agriculture in the United States, held at Ohio State University in 1902, and afterwards of similar schools under the auspices of the Association of Agricultural Colleges at Cornell University, the University of Illinois, Iowa State College, Michigan Agricultural College, the University of Missouri, and Massachusetts Agricultural College. These schools greatly stimulated the establishment of graduate courses in agricultural colleges.

The work of the Office of Experiment Stations was enlarged in 1894 to include investigations in human nutrition carried on under the immediate direction of Professor Atwater. Through this work Dr. True became interested in education and research in Home Economics, which he has actively promoted.

Afterwards the supervision of the irrigation and drainage investigations of the Department of Agriculture was committed to him, and much useful work in these lines was done through the Office of Experiment Stations.

When the Federal Government undertook the management of agricultural experiment stations in Alaska, Hawaii, and Porto Rico, this work was put under the Office of Experiment Stations. In recent years this has been enlarged to include stations in Guam and the Virgin Islands.

With the development of Farmers' Institutes as the most popular form of agricultural extension work carried on by the agricultural colleges and the state departments of agriculture, Dr. True did what he could to promote this form of agricultural education, and since 1904 a special officer for this purpose has been working under his direction.

In 1913 he was chairman of the official delegation representing the United States at the General Assembly of the International Institute of Agriculture at Rome, Italy, and since then, has been chairman of the committee on relations of the Department of Agriculture with the Institute.

In 1914 he was president of the Association of Agricultural Colleges and Experiment Stations.

On the passage of the Smith-Lever Extension Act, Dr. True was made chairman of a committee to represent the Secretary of Agriculture in the administration of that Act, and beginning with July 1, 1915, he has been Director of the States Relations Service, which has included the Office of Experiment Stations, (without the irrigation and drainage investigations, transferred to the Bureau of Roads), two Offices of Extension Work, (just now being united in one office), the Office of Home Economics and Divisions of Farmers' Institutes and Instruction in Agriculture.

With the national development of the Farm Bureau movement, which originated under the auspices of the Department of Agriculture and the agricultural colleges and which on its educational side has been closely related to the work of the agricultural extension agents, the American Farm Bureau Federation in its constitution provided that the Director of the States Relations Service should be in effect an advisory member of its Executive Committee. In this

capacity Dr. True has worked with this committee in the interests of coöperative effort to promote agriculture and country life. He has been glad to do this because he believes that under present conditions it is highly important that the people on our farms should be thoroughly and sanely organized in order that they may stand on an equality with people in other occupations in promoting measures for their own and public welfare.

In the United States it is, in his judgment, important that the Government shall foster coöperative efforts by the agricultural people, as it has been successfully done in other countries, and that it shall, through educational enterprise, supply the technical advice and assistance which is necessary in making coöperative attempts to improve agriculture and country life.

Dr. True has also been active in the Country Life Association, which has aimed to unite in coöperative effort the public and private agencies working on social problems of the rural people.

LIBERTY HYDE BAILEY

1858–

Liberty Hyde Bailey, who succeeded I. P. Roberts as director of the College of Agriculture of Cornell University, was born on a fruit farm at South Haven, Michigan, March 15, 1858. Mr. Bailey brought to his college work a love and understanding of nature, a power of expression, a capacity for work, genius for inspiring leadership, a radiant and indomitable spirit, and a prophetic foresight, which qualified him in rare degree to take the leadership of a college of agriculture in a great university just at the time when agricultural education needed far-sighted leadership.

The College of Agriculture had struggled for funds and facilities and had fared but meagerly. In most of the states in the Union, the state governments had come to the aid of the agricultural colleges with some funds, mostly small, to supplement the incomes from the original land-grants for these institutions. As yet, New York State had assumed no responsibility for the College of Agriculture in that State, although it had made a few small grants for special purposes. At the outset, Director Bailey persuaded the Trustees of Cornell University to ask the State to recognize the College of Agriculture as a state institution, and to provide for its equipment and maintenance. There was opposition in the State, mostly from other institutions. The fight was a test of strength and of sound state policy for education, and Director Bailey revealed his full powers of leadership,

of clear and logical argument, and of compelling conviction. Victory came the first year, when the State appropriated $250,000 for buildings for a New York State College of Agriculture at Cornell University. This was, at the time, a large grant for agricultural education. Two years later, in 1906, after another legislative struggle, Director Bailey accomplished the passage of an Act fully recognizing the College of Agriculture at Cornell University as the New York State College of Agriculture, defining broadly its powers of resident instruction, research, and extension teaching, and placing the administration in the hands of the Trustees of Cornell University as agents for the State.

Then followed rapidly the growth of the college in buildings, land, faculty, and student body. The legislature was generous. Provision was made for the erection of substantial buildings for agronomy, animal husbandry, poultry husbandry, home economics, forestry, a great auditorium, barns and greenhouses, costing with their equipment approximately $800,000 in addition to the first appropriation in 1904. The curriculum was broadened, departments of instruction covering practically the entire field of Agriculture were established, and a staff of persons engaged to develop the work.

He has the art of speaking and writing in phrases that so command the attention of boys and girls, young men and young women that facts and truths of science bud, blossom, and fruit in personal devotion and community action.

Dr. Bailey enjoyed farm life because he had been reared on a farm. At the age of twenty-four he was graduated from the Agricultural College at Lansing, Michigan, and

Liberty Hyde Bailey

was associated at once with Asa Gray at Harvard, the most scholarly botanist of America.

He was professor of horticulture and landscape gardening in the Michigan Agricultural College for three years, and from 1888 to 1913 he was in horticultural leadership of Cornell University, Ithaca, New York.

Dr. Bailey served as chairman of the world famous "Commission on Country Life" appointed by President Theodore Roosevelt in 1908. This was the greatest opportunity and responsibility for country life improvement that any American has ever enjoyed, and he made the most of both the opportunity and responsibility.

He has edited three Cyclopedias of Horticulture and Agriculture totaling fourteen large volumes. He has written five series of manuals and texts for Rural Life and Rural Schools, totaling more than twenty volumes. He has also written thirty elaborate books on various phases of horticulture, agriculture and country life. No other American has been editor and author of as many volumes on the art and science of activities in field, forest, and farm as has Liberty Hyde Bailey, and no one has written upon any one of his subjects more acceptably than he.

When Dr. Bailey retired in 1913, under protest from faculty, alumni, and trustees, he left a college set far forward in its development, well housed, well manned, and with an impetus and purpose which has never left it. World leaders in Agriculture generally agree that no other nation has had an individual in its country who has done more to promote scientific Agriculture than Liberty Hyde Bailey of New York who has done so much for the United States.

EUGENE DAVENPORT

1856–

Eugene Davenport was born at Woodland, Michigan, June 20, 1856, the only child of George Martin and Esther Davenport. He grew to young manhood on a Michigan farm where he helped his father round out and develop a pioneer home. He paid his way through the Michigan Agricultural College, receiving the degree of Bachelor of Science in 1878, Master of Science in 1884, and Master of Agriculture in 1885.

Subsequent to graduation, he returned to his father's farm and as partner worked upon this farm for ten years. He dug ditches and laid tile every month of the year, developing the farm along most improved lines. During the winters he taught in public and private schools.

About ten years after his graduation, he was recalled to his Alma Mater as Professor of Agriculture and Director of the Agricultural Experiment Station, serving efficiently in what was a remarkably difficult position. He accepted an invitation to a harder position, namely the attempt to found and organize a Government Agricultural College in Brazil, being president of the Collegio Agronomica, Sau Paulo, Brazil, in 1891 and 1892. This effort proved premature on account of the unsettled condition of the government, and he returned to America by way of England. With a broadened outlook and a wider range of experience he was ripe for the proposal from President

Andrew S. Draper of the University of Illinois that he come to that institution as Dean of the Agricultural College and Director of the Agricultural Experiment Station. He accepted this position in 1895 and held it until 1922. Since 1922 he has been the Director Emeritus.

At its beginning, in 1895, the task was not an easy one as it was a question of trying to make bricks without straw; there were but nine students and three instructors in agriculture, with no building, no equipment of any kind. Surely here was a field where opportunity was ready for ability. Ability came, a skillful manager and organizer in the person of Eugene Davenport, who is entitled to all the credit he may ever receive for the splendid upbuilding of the great Agricultural College of the University of Illinois and for his unsurpassed services in the promotion of agricultural interests and affairs of the state at large. He was a skillful administrator, stimulating the accomplishments and the best that was in his associates. While agriculture has been steadily growing in Illinois, he has contributed largely to the wealth and worth of community life and social well-being by projecting his personality into the hearts and minds of the thousands of young men and women and older people who have come in direct contact with him. These men and women and are proud to do him honor as a modest citizen who has led a pure, wholesome, uplifting life and has efficiently discharged, day by day, the duties of the office which he has so skillfully administered and so highly magnified.

He has written abundantly for the agricultural and general press, as he issued frequent reports and bulletins. He has been the author of *Principles of Breeding; Education*

Eugene Davenport

for Efficiency; Domesticated Animals and Plants. He holds membership as a fellow in the American Association of Agricultural Colleges and Experiment Stations; is a member of the National Geographical Society; the Michigan Academy of Science; the Society for the Promotion of Agricultural Science; and the Authors' Club of London. Outside honors have been frequently bestowed. He has been recognized on public programs and called upon to deliver addresses in most of the states of the Union. The honorary degree of Doctor of Laws was conferred upon him in 1907 by the Michigan Agricultural College and likewise in 1913 by the Kentucky State University.

He has built a great personal career, the establishment of an honorable name, rightfully earned, and widely recognized, the attributes of a truly great man. Few men have done so much for any state as Dean Davenport has done for Illinois. Every child in that great state likes to read his stories about farm animals and better ways of living. What a credit it would be to our educational system if children could study more about such men who have labored to build up civilization, rather than taking up so much valuable time studying the lives of warriors who have excelled in what they destroyed.

HENRY PRENTISS ARMSBY

1853–1921

The list of noted men who have gained international fame in the field of Agricultural Science contains the names of few who have rendered greater service than has Henry Prentiss Armsby.

Henry Prentiss Armsby was the son of Lewis Armsby, a native of Sutton, Massachusetts, and of Mary A. (Prentiss) Armsby, a native of Northbridge, Massachusetts, and was born September 21, 1853, in Whitinsville in the town of Northbridge. His parents moved to Millbury, Massachusetts, when he was but a very young boy.

A friend of Henry Armsby recently said, "Henry had the good fortune of being born of humble parentage, of the good reliable common folk of New England of a couple of generations ago." For his pursuit of advanced studies he was to a large degree dependent upon himself, and in that respect he may be called a self-made man. He showed that his early training had included close application, economy, and abstinence, and that the attributes of moral courage and of self-denial were also his. His father was an artisan, an expert pattern-maker in the Whitinsville shop.

His parents were members of the Congregational Church. Henry joined the Second Congregational Church of Millbury, Massachusetts, on January 3, 1869, when a little over fifteen years old. The pastor at that time was the

Reverend Stacy Fowler. It is indicative of his character that young Armsby remained loyal to his church relation throughout his college days, and not only there; as he pursued his advanced studies in the University at home as well as in Germany and came in contact with educated unbelievers and scoffers, his faith remained unshaken. And as he took up his active life and started to become known as a great scholar and investigator, he was still known as a leading member of the church.

When a boy H. P. Armsby went to the common schools in the towns of Whitinsville and Millbury, Massachusetts. In 1868 he entered the Worcester Polytechnic Institute, then known as the Worcester County Free Institute of Industrial Science, where he took the course of general chemistry and whence he was graduated at the age of eighteen years, in the first graduating class (1871), with the degree of Bachelor of Science. This was at the time of small beginnings for this Institution which first opened its doors to students in 1868, and had a faculty consisting of but five persons. During the year 1871–72 there were eight members of the faculty, one of which was young Armsby, who remained at the Institute a year as assistant in chemistry. During the years 1872–74 he pursued post-graduate studies at the Sheffield Scientific School at Yale University and in 1874 received the degree of Bachelor of Philosophy.

It is interesting to note how a young man may profit and be guided into his life's work by coming in contact with enthusiastic men of broad vision, if he but takes advantage of the opportunities. At the Sheffield Scientific School Dr. Armsby came in contact with the master mind and

Henry Prentiss Armsby

enthusiastic investigator, Samuel W. Johnson, Professor of Agricultural Chemistry and Director of the Connecticut Agricultural Experiment Station, and here we can say he began his career as an investigator. He presented his first paper, the result of his investigation, before the American Association of Agricultural Colleges and Experiment Station at Hartford, August, 1874, on the topic, "The Decay of Nitrogenous Organic Substances."

After completing his studies at Yale, he taught natural sciences in the Fitchburg (Massachusetts) High School for one year, 1874–75. Here, as before, he had to depart for a short time from his real calling. During the following year, however, he went, together with his friend, E. H. Jenkins of Yale, to the University of Leipzig, Germany. This undoubtedly was a most fruitful year for the young scholar and the one which definitely decided his future work. Not only did he come in contact with the professors at the University but with the director, Gustav Kühn, of the foremost Agricultural Experiment Station of Germany located at Möckern, a short distance from Leipzig. At this Experiment Station, digestion experiments with cattle were carried on by the aid of a Pettenkofer respiration apparatus. This work made so great and lasting an impression upon Armsby, that it came to be his main line of investigation and research.

While at Leipzig he published, in the German language, the result of his investigations in a paper entitled, "Über die Einwirkung der Schwefelsäure auf Phosphorsauren Kalk." (The influence of sulfuric acid upon calcium phosphate).

Upon his return to the United States he accepted a position as assistant chemist at Rutgers College, New Bruns-

wick, New Jersey, for the year 1876–1877. While stationed here, he had published in Germany a paper entitled "Über das Absorptionsvermögen des Bodens für Basen." (The power of the soil to absorb bases.)

From New Brunswick he was called back to Yale at the recommendation of his former teacher, Director Samuel W. Johnson, to be chemist at the lately organized (1875) Connecticut Agricultural Experiment Station, and this position he held during the years 1877–1881. These were for the young chemist exceptionally busy, important, and eventful years, crowded with advanced studies, experiments, writing, and lectures. There, while still filled with enthusiasm from his study abroad and his contact with great German scientists, he began the translation of Wolff's *Landwirtschaftliche Fütterungslehre*, but, as he said, so much else was needed to suit the work to the American agricultural conditions that it finally came to be practically a new book. This was published in 1880 under the title *Manual of Cattle Feeding*. It was a book much needed, the first one of its kind in this country, and it caused a great deal of comment and received much favorable criticism. From other publications of his dating from this period it can be seen that the tendency was more and more toward the animal nutrition problems.

In 1879, again in company with his friend Jenkins, he received the degree of Doctor of Philosophy from Yale University. On October 15, 1878, he had married Lucy A. Harding of Worcester, Massachusetts, and to them were born five sons, — Charles Lewis, Ernest Harding, Sidney Prentiss, Henry Horton, and Edward McClellan.

Dr. Armsby was often invited to appear before scientific

organizations and meetings of agriculturists to lecture on such subjects as the "value of silage" and to discuss other topics which began to interest the farmers in that early period of experiment station work.

In the year 1881 Dr. Armsby accepted the professorship in Agricultural Chemistry at Storrs Agricultural School, Mansfield, Connecticut, now the Connecticut Agricultural College, and remained there until 1883. During these years at Storrs his pen was not idle, for from that period we have the *Farmers' Annual Handbook*, by Armsby and Jenkins.

At Madison, Wisconsin, an Agricultural Experiment Station was being organized, and a man was needed to direct the experiments. In 1883 Dr. Armsby accepted the double position of Professor of Agricultural Chemistry of the University of Wisconsin, and Associate Director of the Agricultural Experiment Station of Wisconsin. While at this experiment station he planned and carried out a large number of trial tests along different lines, but especially do we note the beginning of digestion experiments with farm animals. The first really scientific digestion test in this country was planned and carried out by Dr. Armsby at the Wisconsin Experiment Station, and the report of that experiment was published in 1885 in *The American Journal of Science*. The animals were two sheep, the feed being clover hay, malt sprouts, and cottonseed meal. The planning of the work was so carefully and so thoroughly done that even to-day, after many years of experience, it will be difficult to suggest improvement.

In the year 1887 he was called from Wisconsin to become the Director of the Pennsylvania State College Agricultural Experiment Station which was then to be organized under

the Hatch Act. Under his directorship the work of this Experiment Station was organized and experiments started in various lines to meet the demand of the farmers throughout the State. The clamor then was for something practical, investigations which would point the way for immediate increased returns from the farms. In spite of the time and energy required for such investigations, administrative work, and the public demands upon his time, Dr. Armsby held firmly to his ideals concerning scientific research in America, as the only solid foundation upon which to build the nation's future advancement in agriculture, and he planned and carried on scientific digestion experiments with cattle.

Early in his career his mind had fully grasped the idea of conservation of energy as applied to the nutrition of animals, and he clearly saw the importance of the matter both from the economic as well as the scientific standpoint in relation to farm animals. The theories advanced by the early German investigators did not fully satisfy him, and his dream was to be able some day to clear the matter up to his own satisfaction. But, with a fast-growing institution and the multiplying demands from the public, time and opportunity for deep scholarly scientific research was growing less and less, and whatever was done had to be done at the expense of his reserve strength and health. However, people had faith in him, and at the head of the United States Department of Agriculture were broad, open-minded scientific men who could see the need of things as Armsby saw them. In 1898 a proposal was formally made by the Federal Department of Agriculture that the Pennsylvania Agricultural Experiment Station undertake investigations

into the fundamental principles of nutrition in coöperation with the United States Department of Agriculture.

It was proposed to study the energetics of the animal organism as related to its nutrition. Thus it was imposed upon the investigator to know the total energy of feed introduced into the animal, to determine the amount left unused in the various excretions from the body, to measure the heat given off by the body, and to determine the quantity and kind of gases escaping from the animal. For the measurement of the heat and gases the special instrument called the respiration calorimeter, large enough to accommodate mature cattle, was constructed, and to carry on this special research work the Institute of Animal Nutrition was organized. With the completion of the respiration calorimeter a new era of research was entered upon in the field of animal nutrition.

After a few years of patient toil in that research department, the real crystallization of his life's work as a scientist can be said to have begun, and the results obtained carried the fame of the investigator and the Institute over the whole world.

Thus, from the results of several years' experiments with steers by means of the respiration calorimeter, Dr. Armsby was able to prove that the isodynamic theory of Rubner, was erroneous, and decidedly so when applied to cattle. This theory supposes that the energy in digested nutrients replaces the loss from animal body tissue, calorie for calorie, a theory which had been tenaciously adhered to by many scientists. It was also brought out very clearly that digestibility is not a reliable basis on which to build a feeding standard.

Further, it was not only demonstrated that the animal is a converter of energy, but that the total activity of the animal organism can be expressed in terms of heat. This again has made it possible to simplify the feeding standard so as to use but two factors, protein and therms (1000 calories), instead of three — protein, carbohydrates, and fat, and this simplification is of inestimable value to stock feeders.

But demands upon his time from scientific organizations and societies increased, and with the rapidly increasing work in connection with the School of Agriculture and Agricultural Experiment Station, the time came when something had to be done to save himself from total collapse and the research work from failure. In the year 1907, therefore, he gave up the directorship of the Experiment Station to become Director of the Institute of Animal Nutrition which was organized as a separate department of the State College and in that capacity he labored until the end.

Besides the publications already mentioned, Dr. Armsby wrote a large number of bulletins and other articles on various topics and also several valuable addresses which he delivered before different organizations. In 1903 he published his book, *The Principles of Animal Nutrition.* This volume of over 600 pages deals with the income and expenditure of matter and energy in the animal organism and is a work suited to advanced students, being too technical for a textbook for undergraduate work. Realizing the need for a scientific textbook on Animal Nutrition, he prepared, and in 1917 published, *The Nutrition of Farm Animals,* a book of about 750 pages, fully up-to-date on the problems of nutrition, suitable as a textbook, as well as a reference book

both for investigators and practical agriculturists. Another smaller book, *Conservation of Food Energy*, a condensed treatment of the problems of food as a source of energy, pointing out that careful feeding will save much of the world's food-energy supply, was published in 1918.

Dr. Armsby was not only a great scholar, scientist, and investigator, as already said, but he was also active as an organizer of institutions and societies that aim to stimulate interest in scientific research in agricultural science, and to instruct the public in the need of such advanced work. He was likewise responsible for those organizations which constitute the machinery for the dissemination of results, the exchange of ideas among the investigators, and the guidance of research work along proper lines.

The early experiment stations which Dr. Armsby was connected with and helped to organize became in a way models for many of the later ones. Among other organizations through which he, as a leader of advanced thought, has exerted a great influence, may be mentioned the Association of American Agricultural Colleges and Experiment Stations, with which he was connected from its very beginning, serving as its secretary in 1890 and as president in 1899, also the American Society of Animal Nutrition, later the American Society of Animal Production, of which he was president, 1908–1911, and the Society for the Promotion of Agricultural Science, which he served as president from 1905 to 1907. The latest organization and the one through which he had hoped to do most for the advancement of the science of Animal Nutrition, was the National Research Council of which he was a member; he was chairman of the sub-committee on Animal Nutrition.

In the fall of 1918 he was sent to Europe by the United States Government as a member of the Inter-allied Scientific Food Commission. He was chairman of the Committee on the Experiment Station Exhibit at the Chicago Exposition, 1893, and later held a similar position at the exposition in Paris in 1900. At the Panama International Exposition held at San Francisco in 1915 he received the gold medal for the Institute of Animal Nutrition Exhibit — the model of the respiration calorimeter. He served on the editorial committee of the *Journal of Agricultural Research* and on numerous important committees in connection with the State College and other organizations, and his advice was sought far and near. Only a few months before his death he had been consulted by the Czechoslovak Government through its legation in Washington about the organization of a National Institute for Food Research in that country, and such an institution will be established according to his advice.

Besides the academic degrees already mentioned, Dr. Armsby was honored by many institutions and countries. In 1904 the University of Wisconsin conferred upon him its degree of Doctor of Laws, and in 1920 he received from Yale University the honorary degree of Doctor of Science, and the same degree was bestowed upon him the following year, 1921, by his Alma Mater, Worcester Polytechnic Institute. He was elected a member of the Royal Society of Arts of Great Britain in 1911 and a foreign member of the Royal Academy of Agriculture of Sweden in 1912. He was made a member of the National Academy of Science in 1920.

Henry Armsby was a man of average height and slender build. He was not a social man in the usual sense of that

word and would not waste his time in trivial and foolish things. Being a scholar and thinker, he acquired a sober, thoughtful expression and gave the impression of being distant. That impression, however, vanished the moment he spoke, for the kindly expression and genial greeting and courtesy instantly inspired confidence. He was never hilarious or boisterous, but during friendly intercourse one would frequently hear his short, genuine, characteristic laugh. He was very modest, almost to timidity, and always kept himself in the background. There was always a calm dignity and gentlemanliness and an unruffled appearance about him, and he was such a master over himself that those who have known him intimately during the last thirty-four years never saw him lose his temper. Conservative by nature, he was most considerate of the feelings and rights of others. He was personally acquainted with many great scholars and investigators at home and abroad, and he thoroughly enjoyed their company through their books and investigations.

Good health and scholarship are not synonymous terms. The scholar's sedentary habit and lack of opportunity for proper physical exercise, are the causes of much illness and many untimely graves among that class of men. Dr. Armsby came to State College in the full vigor of his manhood, well aware of the laws governing bodily health, but alas for good resolutions with men who forget themselves in serving others. His heroic efforts and good resolutions were often thwarted by adverse and perhaps uncontrollable circumstances. During his early years at the State College, he rode horseback for exercise, and believed the saying that "there is nothing better for the inside of a man than the outside of a horse." After a while he changed

from riding to driving with his family. But the coming of automobiles ruined the pleasuring of driving and, since his horse was one of those who refused to recognize them as harmless competitors, it was at last disposed of. With his growing family of boys he changed to tennis for bodily exercise. This is of course an irregular and intermittent sport and dependent upon suitable weather. It was noticeable how year after year the daily exercise lessened, while all the while he was working harder at his desk until, in consequence of constant sitting bent over a desk, he acquired the intense scholar's trade-mark — the permanently curved shoulders. Many things interfered with taking regular outdoor exercise; now inclement weather, again a faculty or committee meeting spoiled the day, some report had to be ready at a given date, an article or a paper must be ready in time for some meeting, or a manuscript for a book or bulletin had to be pushed, and sometimes he was away on business. Thus very frequently his exercise was postponed from one to many days at a time, all because of putting others before himself, so that at last his health began visibly to fail and in later years he was obliged to go South to recuperate, only to work harder than ever afterwards to catch up. As a last effort of bodily outdoor exercise he acquired golf clubs and as a religious duty almost, whenever the weather permitted, he would go out, mostly by himself and knock the ball around on the campus, no doubt thinking hard over some problem as he walked about hunting the ball. But a little golf now and then, often at long intervals, is not enough to counteract the long hours of continuous work at a desk. Thus toward the last he was working so close to the breaking point of his body machinery that the shock

and slight accident to a leg, sustained in falling over some obstacle, which compelled him to remain indoors for a while, was the beginning of the end. He forced himself to continue work on matters of importance but his weakened blood vessels could no longer stand the pressure and allowed his blood to seep through, ending the life of a noble man, who, because of his clean, moral, and religious life from childhood up, kept his mind bright and brain clear to the end.

ALBERT RUSSELL MANN

1880–

In 1853, a sailing vessel set out from the coast of Scotland, bound for Quebec. Among its passengers on a stormy and uncertain voyage were David Mann, his wife, and his young son William, emigrating from Dundee to the land of promise. Finding their way into southern Quebec, they carved a farm out of the forest, burning the trees for charcoal, from which a small income was derived. Later, the family moved to Pennsylvania. While the father, David, remained a farmer until his death at the age of eighty-one, William, in his young manhood, became a mechanic, and later, by independent study — for he had attended school but little in childhood, — and by hard application, became a civil and mechanical engineer, and consulting engineer. It was while he was engaged in this work that Albert Russell Mann was born at Hawkins, Pa., near Pittsburg, on December 26, 1880. In the latter's early childhood, the family moved to a farm in western Pennsylvania; but when Albert was eight years of age, they went back into the city where the father continued his work in engineering.

Albert R. Mann was educated in the public schools of Pittsburg and was graduated from the Pittsburg Central High School in 1899. For two years thereafter he worked about blast furnaces at Pittsburg as an apprentice draughtsman, where at the time his father was chief engineer. It was during two years of work in the uninviting environment

of pig-iron production, that he formed a resolution to study at an agricultural college, to fit himself for farming. The fall of 1901 found him registered as a freshman in the College of Agriculture of Cornell University at Ithaca, New York. He finished the four years course in three years, being graduated in 1904. At the close of his senior year he was elected to the honorary Scientific Society of Sigma Xi.

In 1906, he was married to Mary Douglass Judd of Port Henry, New York, also a member of the Cornell graduating class of 1904.

Throughout his college course, Mr. Mann had steadfastly looked forward to establishing himself on a farm. But like many young men who are partially or wholly self-supporting during college, he came to the end of his college course without funds and turned to teaching as a means of earning money. During 1904–05 he was assistant superintendent of the Boston Farm and Trades School on Thompson's Island, Boston Harbor, the oldest school of its kind in the country. A year after graduation, he was brought back to Ithaca to serve as personal secretary to Liberty Hyde Bailey in the preparation of the *Cyclopedia of American Agriculture.* Here began processes which vitally affected the later life of Mr. Mann. The work on the Cyclopedia, requiring four years for its completion, brought the young man into contact with the entire field of agriculture in the United States and Canada and established a correspondence acquaintance with workers in every field related to agriculture throughout the nation. But most valuable of all was the opportunity for intimate acquaintance and daily association with that great leader in American Agriculture, Dr. L. H. Bailey.

Albert Russell Mann

Albert Russell Mann had the good fortune to have known I. P. Roberts, a man of power and practical sense and unbounded faith in the future of farming and of the service of agricultural education. He studied in Roberts' classes for two years. He was also a student under L. H. Bailey, being graduated with the degree of Bachelor of Science in Agriculture in 1904, at the close of Bailey's first year as Director of the College. Indeed, in his senior year, he served as chairman of the student committee which held a monster celebration to mark Bailey's victory before the State legislature in obtaining the first large State appropriation for the New York State College of Agriculture.

After completing the work on the *Cyclopedia of American Agriculture* in 1908, Mr. Mann held for brief intervals appointments, first, as an assistant professor of Dairy Industry in the College of Agriculture, then secretary to the Commissioner at the head of the State Department of Agriculture, followed, in 1910, by appointment as secretary, registrar, and editor for the New York State College of Agriculture at Cornell University. He continued in this position until 1915, when he was made Professor of Rural Social Organization. For the year 1915–16, he was granted leave of absence for special study at the University of Chicago, from which institution he received the degree of Master of Arts in 1916.

On the retirement of Dr. Beverly T. Galloway as Dean of the College of Agriculture in July, 1916, Professor Mann was appointed Acting Dean of the College for one year, assuming office on August 1, 1916. On July 1, 1917, he was elected by the trustees Dean of the College, Director of Agricultural Extension, and Director of the Cornell University Agricul-

tural Experiment Station, which positions he holds at the present time.

The period of his incumbency of the deanship has been a peculiarly trying one for all educational institutions. The war depleted the colleges, largely stopped their progress for a time, and its close brought popular demands for economy and retrenchment. Nevertheless the New York State College of Agriculture has made important gains under Dean Mann.

The war itself made heavy demands. On April 13, 1917, Dean Mann was appointed by the Governor of the State as a member of the New York State Food Supply Commission, and was made Secretary of the Commission and the Commissioner in charge of food conservation. Later, this Commission was dissolved and replaced by a smaller New York State Food Commission of three members, of which Dean Mann subsequently became one. In this capacity he served as one of the Federal Food Administrators for the United States Food Administration.

Despite the disturbances of war, the College of Agriculture has moved forward. Much internal reorganization looking toward closer coördination of the work has been effected. A department of Rural Social Organization to cover the social and human problems of country life has been established. The Department of Rural Education has grown from a small and inadequate unit to the largest department of its kind in the country. A demonstration department of vocational agriculture and home economics has been established in a neighboring village as an adjunct to the college department of rural education. There has been large development of the work in agricultural econo-

mics. From a single professorship in rural economy, this highly important phase of agricultural education and research now engages the services of a large corps of specialists covering its many departments. The work in home economics has been enlarged and established as a professional School of Home Economics. Agricultural journalism has made much progress as a department of instruction. Other lines have been strengthened by additions to staff and facilities. The resident work of the College has been set forward by the creation of a vice deanship of resident instruction.

The need to provide every facility for research found recognition in the creation of the office of vice director of research in 1920. Substantial additions have been made to the research staff. Lands and facilities have been provided for experimental units away from the institution, in three distinct agricultural areas of the State, to supplement and confirm the experimental work done at the institution, as well as to provide for original work. Affiliation with the State Experiment Station at Geneva has been effected on a basis highly advantageous to both stations. Land for a biological field station, chiefly for research, has been obtained at the head of Lake Cayuga, where exceptional opportunities for biological investigations are to be found. A number of field buildings, highly essential to the conduct of the experimental work, have been provided.

Agricultural extension teaching had its inception in New York State in 1893. From that date its progress has been notable. In 1917, Dean Mann arranged for its special supervision under a vice director of extension. The entire State has been organized with county agricultural agents; slightly more than half the counties have also engaged home

demonstration agents. Three cities, Buffalo, Rochester, and Syracuse, are also coöperating with the College in the maintenance of city home demonstration agents. The junior extension, or boys' and girls' club work, has had substantial development. Special provision has been made to meet the needs of non-English-speaking farmers. A particularly promising program is in operation to aid the 6500 Iroquois Indians on the 87,000 acres of reservations within the State. During the year 1921, the representatives of the College made nearly one million, two hundred thousand direct contacts with farmers and farm women in the State through the extension system.

Immediately at the close of the war, steps were taken to develop a building program for the College, the work of which had outgrown the existing accommodations. With the most intimate coöperation of the farmers of the State and the proper state authorities, a program of new construction approximating five million dollars was presented to the legislature in 1920. It was recognized by the legislature, and authorization was given by that body to plan construction immediately to the amount of three million dollars. A new dairy industry building, costing, with its equipment, approximately six hundred and fifty thousand dollars, has been added as the first unit in the new program. Certain small structures have also been provided for. In the meanwhile, accessions to the farm areas have been made. Since 1916, the operating funds provided by the State for the College have been considerably more than doubled.

For several years Dean Mann has been a member of the Executive Committee of the Association of Land-Grant Colleges. He has been an officer and active member of the

American Country Life Association from the time of its establishment. He has actively participated in many important agricultural movements in State and Nation. In 1921 he was elected Commissioner of Farms and Markets and head of the State Department of Agriculture, but he declined to accept, believing his opportunities for public service to be greater in his present position as Dean of the New York State College of Agriculture.

JOHN FREDERICK DUGGAR

1868–

John Frederick Duggar, agricultural writer, investigator, and teacher, was born at the home of his grandfather, David Minge, on Norwood Plantation near Faunsdale, Alabama, and was reared in the adjoining county of Hale, near what is now Gallion, Alabama. He is the son of Reuben Henry and Margaret Louisa (Minge) Duggar. His father was a country physician and farmer and a pioneer breeder in the South of Jersey cattle and Poland China hogs. Dr. R. H. Duggar was also much interested in horticulture, and his collection of fruits was the most extensive at that time in central Alabama.

John Frederick Duggar was educated in the country schools and later attended the Southern University, Greensboro, Alabama, and the Mississippi Agricultural and Mechanical College at Starkville. In the latter he completed the course in Agriculture and received the degree of B. S. in 1887 and the degree of M. S. in 1888. Later he pursued special courses in Columbian (now George Washington) University, in the summer schools of Cornell University and the University of Colorado, and in the Graduate Schools of Agriculture held at the Ohio State University and the University of Missouri.

His first agricultural position was that of Assistant in Agriculture in the Texas Agricultural and Mechanical College where he remained two years engaged in teaching and

experiment station work. He was next engaged as the editor of the *Southern Livestock Journal*, then published at Starkville, Mississippi, and in conducting a dairy farm. For three years (1893–95) he was Agricultural Editor in the United States Department of Agriculture, editing the section of field crops in the Experiment Station *Record*.

For more than twenty-five years he was Professor of Agriculture and Agriculturist of the Alabama Polytechnic Institute and Alabama Experiment Station, Auburn. For eighteen years he was, in addition, Director of the Alabama Experiment Station, 1903–21. He was the first director of the Alabama Extension Service (1914–20). In 1911 he organized the system of local experiments in Albama by which several hundred experiments have been conducted each year in various parts of the State. As the first director of the Alabama Extension Service, it was his task to formulate the policies of this institution and especially to direct it into the line of coöperative marketing.

Mr. Duggar is now a member of the staff of the Alabama Polytechnic Institute and Experiment Station and is conducting farm management investigations and giving advanced courses of instruction. He is also Lecturer in Agronomy at the Southern Branch of the University of California.

During the eighteen years covered by his directorship of the Alabama Experiment Station, many important investigations were conducted and published by Director Duggar and his colleagues, including especially the following: Methods of inoculating rarely grown legumes; soil improvement by means of rotations, including various legumes; the economical production of pork and investigations on soft pork; chemical investigation of the toxic effect of velvet

John Frederick Duggar

beans on pregnant sows; fertilization requirements of the principal southern field crops under varied soil conditions in Alabama; relative fertilizing value of calcium cyanamid in comparison with better known ammoniates; studies of relative yields, characteristics, and synonymy of varieties of cotton; means of minimizing injury to corn by the black weevil; and an investigation of the life history and means of control of the Mexican bean beetle.

Professor Duggar's two most important contributions to agriculture have been through (1) his investigations of field and forage plants and soil improvement, and through (2) his published writings on a wide range of agricultural topics. In his numerous articles and pamphlets and in his textbooks, he has formulated a system of southern agriculture where hitherto the information was unsystematic and fragmentary.

Continuously since graduation he has been a contributor to various agricultural journals, including especially the *Southern Livestock Journal*, the *Progressive Farmer*, *Breeders' Gazette*, *Southern Agriculturist*, and *Farm and Fireside*. In 1908 he published *Agriculture for Southern Schools*, a textbook on elementary agriculture which has been widely used in the public schools of the South. In 1911 there appeared Duggar's *Southern Field Crops*. This is a well known textbook in the high schools and colleges of the Southern States. These books have been kept up to date. The *Agriculture for Southern Schools* was revised in 1923. A new edition of *Southern Field Crops* appeared in 1924. In that year, also, was published *Southern Forage Crops*.

The results of his work as an investigator have appeared in numerous pamphlets or bulletins published by the Ala-

bama Experiment Station, the Alabama Cane Brake Experiment Station, the South Carolina Experiment Station, and the United States Department of Agriculture.

He was an American pioneer in investigations connected with the artificial inoculation of legumes and published three pamphlets on this subject in the late nineties. Among other lines of research on which he has written extensively are soft pork and the use of peanuts and cottonseed meal as food for hogs. Dr. Duggar distinguished himself in his original classification system for American varieties of cottons, published in the Alabama Experiment Station *Bulletins Nos. 109* and *140*. This schedule of classification has been generally adopted by American and foreign writers on cotton.

Among other subjects covered in his investigation are soil improvement, corn, oats, wheat, alfalfa, clovers, cowpeas, and other forage plants, and the feeding of hogs and cattle. For many years he was a member of the committee on methods of teaching agriculture of the Association of Land-Grant Colleges and a member of various national and state agricultural societies.

Throughout his career as an agriculturist, teacher, writer, and investigator, he has kept closely in touch with the more practical side of agriculture, not only by close attention to the farming operations on the State Experiment Station farm, but by operating a farm of his own. This is now conducted in coöperation with two of his sons and is devoted chiefly to the production of dairy products and forage plants.

He was married at Columbus, Mississippi, June 17, 1891, to Fannie Ambrose Camp, and they are the parents of six children.

Since boyhood he has been continuously interested in the work of educational institutions of every kind and especially in the education of young people of the country. For many years, and wherever he has lived, he has been a teacher in the Sunday Schools of the Baptist Church and for a number of years served as superintendent.

SECRETARIES OF AGRICULTURE IN THE CABINETS OF PRESIDENTS

NORMAN J. COLMAN

1827–1911

Norman J. Colman, agriculturist, journalist, and cabinet officer, was born May 16, 1827, near Richfield Springs, New York. After obtaining an academic education, he went from New York State to Louisville, Kentucky, where he engaged for a time in teaching school. While there he also studied law and received the degree of Bachelor of Laws from the Law Department of Louisville University. After being graduated from the law school, he went across the Ohio River to New Albany, Indiana, and began the practice of his profession as a partner of the Honorable M. C. Kerr, who had formerly been his roommate and classmate, and who in later years achieved national distinction as a member of Congress, dying while serving as Speaker of the House of Representatives. Well adapted to the profession of law, Mr. Colman built up a fine practice at New Albany, and while there was elected to and held for one year the office of district attorney, resigning the position to go to St. Louis. After practicing at the bar of that city for some time, an innate fondness for rural pursuits caused him to purchase a country home, and about the same time he began the publication of the agricultural paper which has since become famous throughout the country as *Colman's Rural World.*

From the beginning of his career he took an active interest in public affairs, and when the country was plunged into civil war as a result of the slavery controversy, he was

among the prominent Missourians who stood bravely in defense of the Union. He served as lieutenant colonel of the Eighty-fifth Regiment of Enrolled Missouri Militia, and both as soldier and civilian aided in preventing Missouri from joining the secession movement, and in establishing national supremacy. After the war he was among those who believed that the victors should be magnanimous in their treatment of those who had suffered defeat, and, as a consequence, affiliated politically with the party which favored restoring all the rights of citizenship to those who had participated in the Southern uprising.

Mr. Colman was elected to the Missouri Legislature in 1885, and, after serving with distinction in that body, was nominated by the Democratic party for Lieutenant Governor in 1868. In that year he was defeated, with all the candidates on the Democratic ticket, but in 1874 he was again nominated for Lieutenant Governor and was elected. A warm friend of popular education, he early became interested in the welfare of the State University of Missouri, and for sixteen years was a member of the Board of Curators of that institution. At the same time he was doing all in his power to promote the interests of the farmers of Missouri and of all the Western States, and throughout all the years of his later life he was exceedingly active in this field of labor. He served as president of the Missouri State Horticultural Society, of the State Live Stock Breeders' Association, of the State Board of Agriculture, of the State Dairy Association, and has been officially identified with many other State and National associations organized to advance the interests of the farmers of the country. His broad and practical knowledge of everything pertaining to agriculture

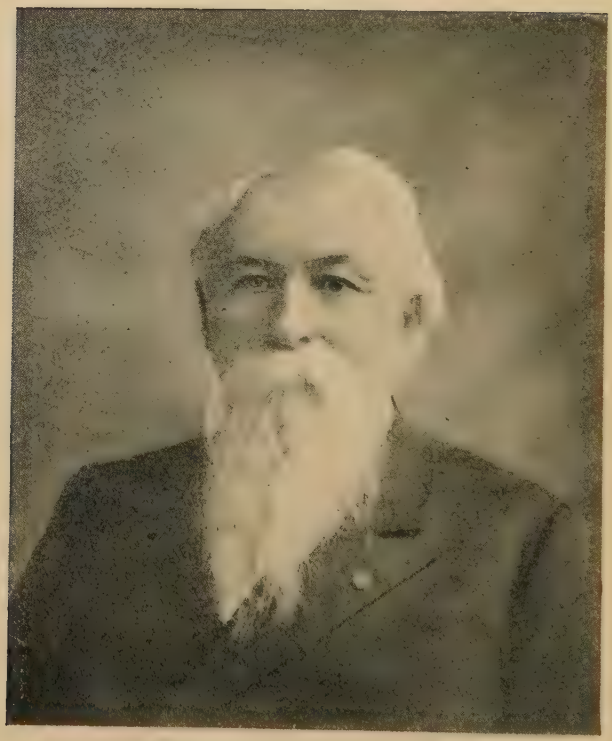
Norman J. Coleman

and agricultural interests, and his eminent fitness to perform the duties of the office caused him to be appointed United States Commissioner of Agriculture in 1885 by President Cleveland, with the result that the sphere of this department was immediately afterward very materially enlarged under his administration.

In 1889 the Agricultural Department was, by act of Congress, elevated to the dignity of an executive department of the general government, and it was provided that the head of the department should occupy a seat in the President's Cabinet as Secretary of Agriculture. President Cleveland at once appointed Governor Colman to the newly created office, and he served in that capacity until the close of the administration, enjoying the distinction of being the first representative of the agricultural interests of the United States to sit in the President's Cabinet. He dignified the position and rendered services of great value to the farmers of the country by his able and eminently practical administration of the affairs of his department. Upon his retirement from the Secretaryship of Agriculture the President of France, through the Minister of Agriculture, conferred upon him the Cross of "Officier du Merite Agricole," which was accompanied by a gold medal and the decoration of the order.

After retiring and until he died he resided at his country home near St. Louis, devoting his time to the editorial management of his famous journal and to his private farming interests. His influence was always strongly and aggressively in favor of progress in the highest and best sense, and he was at the same time an able and useful public official, a journalist whose influence was felt throughout

the length and breadth of the land, and a thoroughly public-spirited citizen in all that the term implies. His work for experiment stations led to his being known as "the father of experiment stations." He died in St. Louis, November 3, 1911.



Jeremiah McLain Rusk

JEREMIAH McLAIN RUSK

1830–1893

The United States is often spoken of as the land of opportunity where a boy, born and reared in humble circumstances, may rise to the highest position in the country. From stage driver to Governor, to Secretary of Agriculture seems a transformation that could take place only in a land of opportunity.

Jeremiah McLain Rusk was born in Morgan County, Ohio, one of a family of ten children. He was reared in close contact with the soil, gaining from the out-of-doors his inspiration, hardihood, and love of truth and reality. He acquired also tremendous physical energy which must have influenced his mental capacity. In later years the effect of his early environment was marked.

When the father died, Jeremiah was fourteen. He had to assume the responsibility of providing for the family. At the age of fifteen, young Rusk was proud to drive one of the old-time Concord stages, and he managed his four horses with the skill that he used in latter life to manage men.

It was during his career as a stage driver that he used to meet James A. Garfield, who, as a canal boy, drove a mule along an Ohio towpath. The youthful stage driver often teased the future president of the United States as he rapidly passed him with his well-fed team of four sprightly horses. The stage driver and the canal boy became fast friends. When, years after, they met in Washington as members of

Congress, they were fond of bantering each other about their boyhood days.

"Oh, you're of no account; you're only a stage driver," Mr. Garfield would remark.

"Well, what are you?" Mr. Rusk would respond, in his bluff, breezy way. "What did you drive? I handled four horses; you steered one little insignificant mule."

In 1849 Mr. Rusk married Mary Martin, of Ohio, and in 1853 moved to Wisconsin and took up a farm in Bad Ax, now Vernon County. In addition to his successful efforts as a farmer, he engaged in stage driving, having established a line between Sparta and Prairie du Chein, and he also opened a hotel in Viroqua, the county seat.

The first incident which marked him as a man of extraordinary capacity brought him the office of sheriff in his county. Two officers arrived in his home asking for a horse thief; and, upon their describing the object of their pursuit, Rusk learned that the thief was a man who had breakfasted at his inn earlier in the morning. While the officers took the road by which the man was most likely to attempt his escape, Jeremiah Rusk jumped on a horse and took another. He rode hard and overtook the fellow riding along in his buggy. Without any warning he jumped from the horse to the carriage, overpowered the man by sheer physical force, and brought him back a prisoner. Such a rough-and-tumble capture of course attracted attention, and the news of it was carried from community to community.

After serving his term as sheriff, Mr. Rusk was elected to the office of coroner, and in 1861 to the state legislature.

On September 14, 1862, he entered the Federal Army as major of the Twenty-fifth Wisconsin Volunteer Infantry, a

regiment which he had raised. He declined the rank of colonel, stating that he lacked the necessary military experience, but his soldierly qualities practically gave him the command from the start. His first service was in the Minnesota Indian campaign, and in 1863 he participated in the siege and capture of Vicksburg. In February, 1864, when in command of his regiment, he joined General Sherman in the famous Meridian campaign. He was complimented by his superior officer for the skill with which he handled his regiment in all the engagements about Atlanta. When General McPherson fell in front of Atlanta, on July 22, 1864, Colonel Rusk was leading the advance and in that hard-fought contest lost one third of his men. At one time in this battle he was cut off from his command, surrounded by the enemy, and ordered to surrender, but by a daring dash he broke through the Confederate line and escaped to his regiment with only a slight wound and the loss of his horse, which fell, riddled with bullets.

In 1865 he was mustered out as a General and returned to his home in Vernon County to become a partner in the publication of the *Vernon County Censor*. Hardly had he been there two months, however, when the State Convention nominated him by acclamation for bank comptroller, where he served until, in 1870, he was elected from the sixth district of Wisconsin as a representative in Congress. The sixth district then embraced nearly one third of the state of Wisconsin. After serving two terms he found that his territory had been redistricted, but so able had been his service, so capable had he proved himself in Congress, that, although he became the candidate from the seventh district, he ran without opposition.

He became Governor of the state in 1882, and his sound judgment based upon long years of experience, for he had never received any training except that of a country school, brought him to the front at once. He served three administrations keeping steadfastly to his motto of "Justice and equality of rights."

He recognized all progress, listened attentively to the calls for assistance, and conducted the state government so well that he was easily reëlected. His attitude toward agriculture had already been made evident, for in his second message, in 1883, he said, "Agriculture is the foremost interest in our state. The societies which have been organized for the advancement of the various branches of agriculture should be liberally sustained. The time has arrived when means should be provided for gathering accurate monthly crop and live-stock reports during the growing season and complete labor statistics and their prompt circulation among the people. The dairy interest of our state has grown with such wonderful rapidity that it stands to-day second to none in the Union." Governor Rusk never neglected the common people, for his heart was filled with a sympathetic understanding of their needs, as was shown, when in 1884 instead of taking a party in pomp and ceremony to a soldiers' convention in Minneapolis, he took an escort of crippled soldiers.

He was ever observant of his state's agricultural condition and willing to outline a progressive program of achievement, giving particular attention to that phase of agriculture which is to-day becoming more and more prominent. He became the friend of Farmers' Institutes and of the State College of Agriculture and insisted that "among the farmer's earliest

lessons to his boy should be those of the real dignity, independence, and responsibility of the farmer's life in itself and in its relation to society and the business of the world." He could then say, "Four fifths of the wealth on which the prosperity of the nation depends is in the hands of the farmers." And, even as he visualized with his coöperators, men who were dreaming of a prosperous agricultural state, he took further pains to see that the Legislature acted favorably upon those bills relating to the prosperity of rural life and the betterment of rural conditions.

He declined to accept the candidacy for Governor a fourth term, but his official life was not ended. When in Congress, he had been appointed by President Garfield and confirmed by the Senate as minister to Paraguay and Uraguay, an appointment he declined, only to be tendered by President Garfield a mission to Denmark and the position of Chief of the Bureau of Printing and Engraving, neither of which he accepted. After serving three terms as Governor of the state, he was appointed Secretary of Agriculture by President Harrison on March 4, 1889. Even then he was so reluctant to take the position that he sent an appeal for assistance to his good friend, W. A. Henry, who was dean of the Wisconsin College of Agriculture. Agriculture had been merely a bureaucratic office, but now it became a separate Department and immediately felt the guiding hand of Secretary Rusk, for he divided the work into two main branches: executive, under his own immediate charge, and scientific, under the Assistant Secretary.

Secretary Rusk urged the necessity of placing the information gathered by the Department more generally in the possession of farmers. He established the Division of

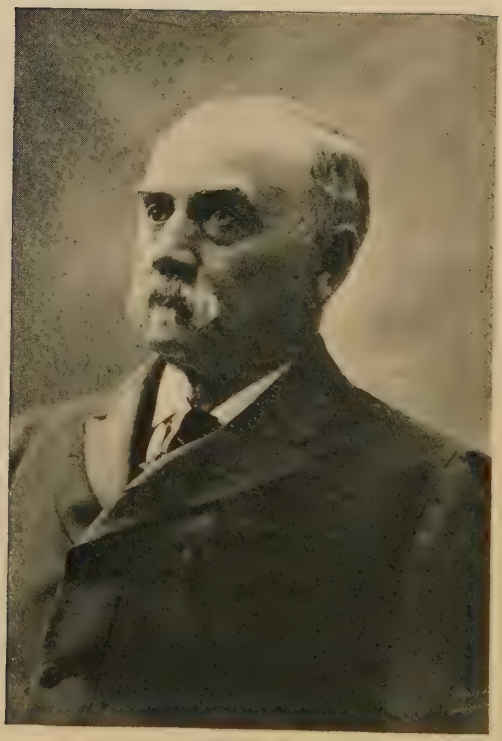
Records and Editing, now the Division of Publications, to edit and supervise publications and administer the printing fund. He recommended the publication of the Farmers' Bulletins, which have since become so popular, and he summarized the work to be done in these as follows, "Frequent publication of the results of scientific work and the circulation of the information among practical farmers, insuring its direct application to actual farming operations." He insisted that the language employed in the bulletins should be intelligible to farmers generally. In addition he planned the publication by press associations, newspapers, and agricultural periodicals of advance reports of the important conclusions reached by experiment and research. He firmly believed that in this way the majority of farmers of the country would be promptly reached; and he was right, for the demand for Farmers' Bulletins grew rapidly from the start. Could "Uncle Jerry" now look at the office which he occupied, he would see that his Department has grown until it inspects the food of every man, woman, and child in the United States, investigates the causes of disease and their remedies, brings in new plants and new crops from foreign countries, considers economies and rural life, and, by insisting upon better farming practices and by careful coöperating with the state departments of agriculture, is welding the agricultural associations into a great efficient organism.

On the 8th of March 1893, General Rusk retired from the office of Secretary of Agriculture, and after that his occupation was described in a letter as follows: "I saw Secretary Rusk yesterday, and what do you suppose he was doing? Building and fixing up the house on his farm — papering, painting, and repairing it and to this he expects to move in

a very short time. He received me in a long room, which had cheerful double windows on all sides, where I could look out and see much of his fine land which was a part of his four-hundred-acre farm. He gave me the one chair in the room and seated himself upon a pile of books which extended along one entire wall. He was attired in an old suit of clothes, which bore evidence of work going on, as here and there was an occasional splash of green, white, or brown paint."

In the fall of 1893 General Rusk was invited to Illinois to inspect and report upon an eighty-thousand-acre tract of land in the Kankakee Valley, and during this tour of inspection he contracted malaria. This together with complications brought his death on November 21, 1893, at Viroqua, and the nation mourned with the state over the loss of their "Uncle Jerry."

Early in 1895 at Viroqua Post, the Grand Army of the Republic erected to Uncle Jerry's memory a beautiful obelisk of Vermont marble, thirty-three feet high. On the side of the shaft above the die is a bronze shield, crossed swords, and a pen with the motto, "Non sibi sed patriae" — "Not for himself but for his country."



J. Sterling Morton

J. STERLING MORTON

1832–1902

Julius Sterling Morton was born April 22, 1832, in the state of New York but later went to Michigan with his parents, where his early life was spent and where his education was received. Immediately after his marriage to Miss Caroline Joy in October, 1854, he went to Nebraska to make his home. Modes of travel at that time were very crude, part of the trip being made by boat via the Mississippi to St. Louis, from St. Louis up the Missouri to St. Joseph, and from there to Council Bluffs by stage.

Mr. and Mrs Morton settled in Bellevue, Nebraska, which was the initial point of settlement in the new territory. Their first home was a log cabin of two rooms. Indians were very numerous in the country at that time, and there were only about fifteen hundred white people in the entire territory.

In 1855 Julius Morton and his wife moved to Nebraska City and built the home which is known as Arbor Lodge. The first building was a log cabin. This was soon replaced by a modest frame house. The first years were years of hardships. Neighbors were few and far between, and the Indians formed their greatest danger. During the first year, after breaking the land, the food for themselves and for their animals had to be brought in from Missouri and Iowa. During the first summer their anxiety was great but after the harvest in the fall they knew that they had settled in a

country which had great agricultural possibilities. They were now sure it was a land that could support its inhabitants.

At the first territorial Fair which was held in Nebraska City in 1859 Mr. Morton made a speech in which he reviewed the history of the new territory. He was always a man of public interests and, though not a working farmer in the strict sense of the word, he devoted much attention to the agricultural interests of the state. For many years he was president of the State Board of Agriculture, a member of the State Legislature, and the National Secretary of Agriculture at Washington during President Cleveland's administration.

Mr. Morton is perhaps best known as the founder of Arbor Day. According to his own record, Arbor Day originated in Lincoln on January 4, 1872. Upon that day the festival was instituted by a resolution of the Nebraska State Board of Agriculture. The plan was thought out by Mr. Morton, written, named, and submitted to the board, which approved it and in turn offered a prize of $100 to the county agricultural society that should plant the largest number of trees on the day, and a farm library worth $25 to the individual Nebraskan who should plant the most. As a result of this stimulus, over a million trees were planted in Nebraska on the first Arbor Day, April 10, 1872. This started a world-wide movement of tree planting. The next year, by proclamation of the Governor, Mr. Morton's birthday, April 22, was set apart as Arbor Day; this day has since been adopted by practically all the states and by England, Japan, and other nations as well.

Mr. Morton's love of trees held a large place in his heart. All his life he preached trees, and nowhere was his influence

felt more strongly than near home. Every farm near Nebraska City has a few pine trees in the dooryard, while at Arbor Lodge they are grown by the thousand and the large collection of trees is a silent witness to his interest in arboriculture. The entire one-thousand-acre estate of Arbor Lodge is an arboretum. Morton Park, an adjoining tract of forty acres containing many noteworthy trees, was

Arbor Lodge, Nebraska City, Nebraska.

given to the city by Mr. Morton. Among the many beautiful sights on the estate are the long avenues of elms and soft maples which are probably without equal on the continent. There are also great oaks, walnuts, and almost all of the known species of trees in great numbers.

The following quotation from one of Mr. Morton's addresses shows what a place trees had in his thoughts: "Here are a few acorns to-day; to-morrow, a century hence, they are sturdy oaks, then ships, railroads, carriages, and

everything useful, and parts of homes which are all — in both poetry and reality — that is lovable, beautiful and supremely tender in the career of humanity from birth to death. The real of to-day was the ideal of yesterday; the ideal of to-day will be the real of to-morrow." In closing his address he said that the epitaph of any man who left behind him groves and orchards for the use of future generations might be, "If you seek my monument, look around you." To quote from Mr. Morton's own words "to avert treelessness; to improve the climatic conditions; for the sanitation and embellishment of the home; for the love of the beautiful and useful combined in the music and majesty of a tree, as fancy and truth unite in an epic poem, Arbor Day was created. It has grown with the vigor and beneficence of a grand truth or a great tree."

Referring to the benefits of Arbor Day, John Burroughs said: "Mr. Morton deserves the gratitude of the whole land. How many naked spots on this vast continent will be clothed in verdure by reason of his happy suggestion! The birds and animals as well as people profit by his wise forethought. Every tree planted upon this day will serve to keep green his memory."

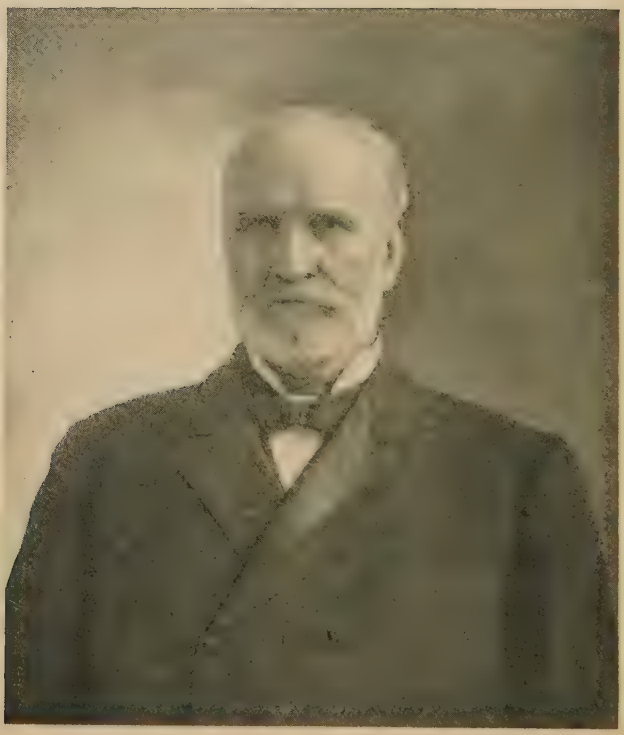
When he initiated Arbor Day, Mr. Morton did not mention its application to schools. This matter was taken up later (1883) by Mr. B. G. Northrop before a meeting of the American Forestry Association held at St. Paul, Minnesota, at which time he offered a resolution in honor of observing Arbor Day in schools in all the states as well as in Canada. He later presented the claims of Arbor Day by personal letters to all the state school superintendents. Though the schools were rather slow in adopting the plan, they finally

came to observe the day not only by planting trees, but often by special programs as well.

Mr. Morton was educated in law but upon coming west he became so interested in helping to develop a new country that he did not put much time on the practice of his profession. For a few years he edited a paper in Nebraska City, through which he had an opportunity of presenting many projects for the good of the commonwealth.

His term of office in President Cleveland's Cabinet was worthy of note because of the several changes which materially strengthened the work of the department. The Division of Soils and the Dairy Division in the Bureau of Animal Industry were established in his time. He secured the first appropriation from Congress for the publication of Farmers' Bulletins which he hoped to substitute for the congressional seed distribution. Although he did not succeed in abolishing the distribution of seeds, he did bring about a plan to see that a much better grade of seeds was sent out. He was as economical in his administration as in his own life. In giving his last report he pointed out that over $2,000,000 had been turned back into the treasury, and he recommended that this amount be used in the erection of an agricultural building. These are only a few of the many improvements instituted during his administration.

He was a great lover of his home and sought to make it as ideal as possible. He had a strong desire to live to be three score and ten years old and this mark he passed by only five days. He died April 27, 1902, leaving four sons, and surviving his wife, whom he had lost in 1881.



JAMES WILSON

JAMES WILSON

1835–1920

James Wilson, Secretary of Agriculture, served longer as a Cabinet officer than any other head of an executive department in the history of our government. Appointed by President McKinley, March 5, 1897, he continued through the Roosevelt and Taft administrations until March 3, 1913.

His long tenure of office is attributed not only to his intellectual power, but also to his pleasing personality and his ability as a conversationalist and public speaker. His warmth of heart captivated many a club member from Boys' and Girls' Clubs who visited the Secretary. An illustration of Secretary Wilson's generosity is told by Rufus Stanley, "dean" of county club agents, and founder of the famous "Omega Club" (Elmira, New York), and the Chemung County Achievement Club, New York.

It happened in April, 1904, when Mr. Stanley made his first appearance in Washington with a party of Club champions. They made a call on the Secretary, and his first remark was, "Mr. Stanley, what is the object of this Omega Club?" Mr. Stanley replied, "To give city boys the advantages of country boys." With a twinkle in his eye, the Secretary said, "Do you think that country boys have more advantages than city boys?" Mr. Stanley's face beamed with a noncommittal smile, and the Secretary turned to Dr. Galloway, his assistant, and said "Please see that these boys have the use of our carriage while here; we can walk!"

Thus the carriage provided by the Congress of the United States for the use of the Secretary was placed at the disposal of the club champions, and, as they rode about the beautiful streets of Washington, there was gratitude in their hearts to the distinguished man whom the people of the nation learned to know so well.

Secretary Wilson gave impetus by word and action to the foundation of the great organization now known as boys' and girls' club work, or junior extension work in agriculture and home economics.

Born in Ayrshire, Scotland, August 16, 1835, he came to the United States with his family when seventeen years old, the eldest of a family of fourteen children. The family went first to Norwich, Connecticut, where they remained three years. They then went to Traer, Tama County, Iowa.

In Traer, James attended the public schools and later was graduated from the new Iowa state college. During these youthful years it is perhaps not strange that the love of fine animals born and bred in him in Ayrshire should remain steadfast; and that when he was graduated from college he should engage in farming on his own account.

In 1867 James Wilson was elected to the Iowa state Legislature and served in the twelfth, thirteenth, and fourteenth General Assemblies, being speaker of the house in the last named Assembly. He was elected to Congress in 1872 and served in the forty-third and forty-fourth Congresses. It was during his service in Congress that Mr. Wilson received the picturesque nickname of "Tama Jim," which fell to him because of his residence in Tama county, and the necessity of distinguishing him in some way from another James Wilson in his own state, who was a member of the

same Congress. When in Congress he always served on the committee of agriculture, and he was active in raising the Department to executive importance. He was, in fact, the author of the bill to that effect, passed by the forty-third Congress.

At the expiration of Mr. Wilson's second term in 1873, he became a member of the Iowa railway commission and a regent of the state university. On December 3, 1883, Mr. Wilson presented credentials as the member-elect of the forty-eighth Congress and served until the closing day, when the House declared Benjamin T. Frederick, contestant, entitled to the seat.

During the closing hours of this Congress an incident occurred which gives us a glimpse into the real character of this great man. The Republicans were filibustering to prevent Mr. Wilson's unseating, by limitation. At the same time, friends of General Grant, who lay dying at Mt. McGregor, were earnestly endeavoring to pass a bill restoring him to his old rank of Lieutenant General of the army. The Democrats with full power to dictate terms refused to pass the bill until they had first voted upon the Iowa contest case. Then it was that Mr. Wilson sacrificed his place for love of the great soldier. He calmly rose and requested his Republican friends to cease all opposition and allow the contestant to be seated, in order thereby to secure the passage of the Grant bill. This was accordingly done. Mr. Wilson was unseated, but he returned to private life with a record for unselfishness and the profound respect of his political foes.

Upon his retirement from Congress in 1885 he remained upon his farm until he became director of the agricultural experiment station and professor of agriculture in the agri-

cultural college at Ames, Iowa, where he served in this double capacity until called by President McKinley in 1897 to serve at the head of the Department of Agriculture.

During the sixteen years covered by Secretary Wilson's administration there were enacted by the Congress a number of important and far-reaching measures, designed to promote the health and prosperity of the people of the United States. These measures were the culmination of scientific work and investigation by the Department, which exposed conditions requiring legislation to remedy them. Some of the more important acts referred to are the Act for the Suppression of Contagious, Infectious, and Communicable Diseases of Live Stock; the Food and Drugs Act; the Meat Inspection Law; the Insecticide and Fungicide Act; the Plant Quarantine Act; the Forest Conservation Act; Predatory Bird and Animal Act, and the Farmers' Coöperative Demonstration Act, which has revolutionized the agriculture of the South and which was the beginning of our great system of coöperative extension work in agriculture and home economics.

The November, 1920, number of the Experiment Station *Record* said in part:

"The above are some of the changes which occurred, the measures inaugurated, and the things accomplished in this remarkable period. While far from a complete review it will serve to show the scope and the magnitude of development of the national Department of Agriculture under wise, progressive leadership. Probably no executive ever gave himself more thoroughly and whole-heartedly to the task before him. He took the deepest interest and pride in the activities of the department and in its growth and influence. He understood the farming people and how to serve them. He

looked upon the whole Nation as his field, and his interest was confined to no section and to no particular branch of the industry. It was said of him on the floor of Congress that 'Secretary Wilson has never known party or sectional lines,' and some of his most ardent support and commendation came from those of opposite political faith.

"It was not that his period of service exceeded that of any previous cabinet officer, covering four successive presidential terms, or that he had come to this high position from the soil through experience in public life and in his State Agricultural College and Experiment Station, that gave him claim to fame, but it was the great constructive advancement he brought about through a national interest for the just recognition of the farming industry. It was a product of this unprecedented term and the preparation which had preceded it — a vigorous rising to opportunity when it opened.

"His last annual report, prepared in the closing year of his term, is a fitting record of the career of one of the most notable figures in American agriculture. As he there wrote, the Department during sixteen years 'has progressed from the kindergarten through the primary, middle, and upper grades of development until now it has a thousand tongues that speak with authority. Its teachings, its discoveries, and its improvements are permeating the national agricultural life. The forces that are at work must cause ever-increasing results.' After paying generous tribute to those who had worked with him and helped to make his success, he concluded with this simple benediction: 'Men grow old in service and in years, and cease their labor, but the results of their labor and the children of their brains will live on; and may whatever of worth that is in these be ever blooming.'

"This closing chapter was written in his seventy-eighth year, nearly eight years before his call came. The interval had reflected his prophecy and wish. It had shown how well he had builded.

"The resolution passed by the Department workers when the news of his death came expresses the homage and affection in which he was held. As there recorded, 'his patriotic devotion to the interests of all the people, his broad vision, and his practical wisdom place him high among those who have deserved well of their country. Beloved as a friend, admired and respected as an officer, his example as a man and a statesman is one to which all Americans may turn for inspiration and emulation.' "

The October, 1920, number of *Successful Farming* contained the following editorial upon the death of James Wilson:

"The Passing of Tama Jim"

"Saturday, August 28, 1920, former Secretary of Agriculture James Wilson, familiarly known as 'Tama Jim,' was buried in his home town, Traer, Iowa. As when the curtain drops upon the last act of a great artist who has appeared in a great play, the audience goes out to always remember the actor and his part; so when the last curtain hid from view the person of James Wilson, it never can shut from memory the influence of this great man.

"Tama Jim is a splendid example of how a foreign-born boy may rise to any height of influence in this country, if he has it in him. Born in Scotland, endowed with the Scotch shrewdness, he picked up a fair education in our schools, but got most of it by incessant study and mingling with

those who knew more than he. His long political experience gave him a knowledge of men that enabled him to select wisely the men needed to build the bureau of agriculture, a part of the patent office of the department of the interior, into the great department of agriculture employing over 13,000 persons when he left its service after serving through three presidential administrations, sixteen years.

"Secretary Wilson was the right kind of secretary. He had the vision of the farms always before him. He was patient, but always arriving at some definite gain for agriculture. Though in life we will see him no more, in his works we will see him ever."

David F. Houston

DAVID F. HOUSTON

1866–

THERE was a unique fitness in President Wilson's appointment of David F. Houston to the office of Secretary of Agriculture on March 6, 1913. The first man to hold that position was another adopted Missourian, Norman J. Colman, whose life of patriotic service to the nation, and especially to the rural world, will never be forgotten. Equally noteworthy has been the record of David F. Houston. No member of the Cabinet contributed more to the success of American arms during the World War than this St. Louis citizen and educator. Truth and not mere eulogy impels the statement that no single class of persons performed its work so well, accomplished the results so soon, and united in labor so patriotically as the American farmer. The leader and director of the 40,000,000 American agricultural population was David F. Houston.

Born in North Carolina on February 17, 1866, he received his collegiate education in South Carolina College and Harvard University. His work until 1913 was along purely scholastic lines. He taught in the public schools of the South, was a tutor in ancient languages at college, professor of political science in Harvard, president of the Agricultural College of Texas, president of the University of Texas, and chancellor of Washington University in St. Louis. In recognition of his educational work, the honorary degree of Doctor

of Laws was conferred on him by Tulane University, the Universities of Missouri, Wisconsin, Yale, and Harvard.

Mr. Houston has always been interested in rural life and agriculture. He was brought up in a part of the country which had no cities of consequence and which still has few, namely, in North and South Carolina. Later, he lived for fourteen years in Texas, a state which is largely rural in character.

Until he reached the age of twenty-one, he lived at the edge of a village of less than 1800 people, on a farm on which all the agricultural activities incident to that section of the country were carried on. Necessarily, he was largely concerned with the processes of agriculture as well as with the educational and social problems of rural life. As a matter of fact, there were no other phases of life and no other problems presented for immediate consideration. The community in which he lived had most of the drawbacks incident to rural life in that day and incident to rural life to-day in many sections of the United States. His knowledge of the difficulties and handicaps was the moving cause of his interest in securing better farming methods, a more scientific agriculture including better business processes, better marketing, good roads, good schools, and other things which would make farming not only profitable, but also healthful and attractive.

Later, when he became definitely connected with higher educational institutions, it was one of his principal aims to secure better schools for people living in rural districts, and the improvement of the underlying conditions. Having specialized in economics and having recognized that the great problem of rural economics had been, relatively speaking,

ignored, he devoted his thoughts especially to such problems, turning his attention particularly to what may be called the second half of agriculture, embracing marketing and rural finance.

Therefore, when he went to Washington as Secretary of Agriculture, he had definite plans in view, such as the creation of a Bureau of Marketing, the development of agricultural education, the improvement of roads, better financial arrangements for the farmers, and better warehousing. He also worked to secure adequate support and satisfactory development in the field of agricultural investigation, and the dissemination of useful information. The records show that within a comparatively few years after he went to Washington, nearly every part of the program he had recommended was embodied in legislation or set on foot through administrative measures. The leading resulting measures passed include: (1) The Coöperative Agricultural Extension Act; (2) The Cotton Futures Act; (3) The Grain Grades Standards Act; (4) The Federal Warehouse Act; (5) The Farm Loan Act; (6) a provision in the Federal Reserve Act authorizing loans on farm mortgages and giving the farmers' paper a maturity of six months; (7) The Federal Aid Road Act; (8) the creation of the Bureau of Markets.

These were followed during the World War by (1) The Food Control Act; and (2) The Food Production Act; two measures resulting from a conference which he held in St. Louis about the time of the breaking out of the war. Their operation and results during the war are well known.

There were other special measures of importance, such as (1) the handling of an appropriation of ten millions of

dollars to buy nitrates for the farmers; (2) special appropriations to facilitate the operations of the Farm Loan Board; (3) a special appropriation of $10,500,000 for the purchase and sale of seed to farmers; and (4) a special allowance of $5,000,000 to be loaned to farmers during the war in the drouth-stricken regions of the West.

One of the underlying thoughts in all of the marketing activities, was to promote coöperation among farmers, not only for production but also for the better handling of their commodities and of their finances.

The foundations of agriculture and rural life were greatly strengthened by these measures. It is noteworthy that the Agricultural Extension Act and the Federal Aid Road Act embodied a new principle in our law, namely, that of securing the effective coöperation of Federal and State agencies by making it necessary that they should mutually agree upon the plans of operation and execute them through expert bodies. No greater gain can be suggested than that which has arisen from this principle, and it is notable that within two years, every State in the Union had developed an expert highway body, whereas before this legislation only a few States had such bodies.

Mr. Houston's entrance into official public life began with his appointment to the office of Secretary of Agriculture. Leave of absence was granted him by Washington University until he requested that his resignation be accepted in 1917. Secretary Houston held his new position until February 2, 1920, when he was transferred by President Wilson from the Agriculture Department to the Treasury Department. This last appointment was made in recognition of Secretary Houston's ability as an organizer and financial

authority. Not only did this educator win commendation for his work as Secretary of Agriculture, but he also gained approbation for his quick grasp of banking and financial economics in his tour of the country several years ago to help determine the boundary lines and centers of the Federal Reserve Bank districts.

He is recognized as a man of great financial ability. One of the important positions he has held was with the American Telephone and Telegraph Company of New York City.

Edwin T. Meredith

EDWIN T. MEREDITH

1876–

Edwin T. Meredith, former Secretary of Agriculture and Publisher of *Successful Farming*, Des Moines, Iowa, was born at Avoca, a small Iowa town. He came from a family in average circumstances and did work of all kinds about the home and on the farm.

He went from the grade school to the high school at Marne, another Iowa town located not far from Avoca. After being graduated from high school, he went to Des Moines, Iowa, and entered Highland Park College. He lived with his grandfather, Thomas Meredith, who was publishing a weekly paper. That he might help himself financially he set type in his grandfather's printing office. When Mr. Meredith left college at twenty years of age, he went to work for his grandfather at eight dollars per week.

During this time Mr. Meredith was developing the three traits of character which his schooling and training and parents had taught him. Three words cover these important principles and Mr. Meredith insists that if they are followed by any boy they are bound to contribute to his success and service. They are:

Integrity
Industry
Imagination.

"Use imagination," says Mr. Meredith, "because only that quality will enable a man who has a little business to

visualize the big one into which it can grow. Use industry, because the dreamer who only locates his castle in Spain will never be able to give a week-end party in it. Use integrity because if men can't trust you they won't dare back up your dreams nor reward your hard work. Many a crook uses imagination and does hard work; but because he won't cap his edifice with the roof of common honesty, he is apt to end his days picking jute instead of picking hot-house strawberries."

Young Meredith induced his grandfather to give him the paper, consisting of a few cases of old type and a small list of subscribers. This paper, the *Farmer's Tribune*, was political in its policy. Mr. Meredith decided that he wished to enter the farm journal field, and in October, 1902, he founded the paper he now publishes, *Successful Farming*. It was necessary that he act as printer's devil, editor, business manager, and mail clerk.

By a stroke of good business he carried his circulation to 100,000 and secured advertising support from the manufacturers of farm implements and of other supplies the farmers had to buy.

Successful Farming has steadily grown from year to year until it has a paid circulation of over 850,000 copies monthly, and the employees number over three hundred. Mr. Meredith's executive staff includes twenty-five to thirty men and women who are recognized leaders in national circles. Some years ago a splendid publishing plant was erected where the paper has since been published. This is one of the best magazine publishing plants in the United States.

Mr. Meredith is a man of good judgment and quick decision and has a wonderful grasp of any business proposition

presented for his consideration. For quite a number of years Mr. Meredith has been identified with Des Moines civic bodies, serving as president and director of many organizations. He has served as president of the Associated Advertising Clubs of the World, Director of the Federal Reserve Bank, Chicago, and was a member of the United

Publishing plant of *Successful Farming.*

States Labor Commission to Great Britain and France, and director of the National Chamber of Commerce.

When the United States entered the European War, Mr. Meredith was made a member of the Excess Profits Commission and was one of many "dollar per year" men who went to Washington to serve.

A number of years ago Mr. Meredith saw the possibilities of working with farm boys and girls because there

was a large number who wanted to become owners of pigs, calves, poultry, and sheep but had not funds to get started. Mr. Meredith decided to lend money to boys and girls so that they might become owners and have a personal interest in farm work. When these loans are made, the boys and girls to whom they are issued are required to become members of the boys' and girls' clubs of the county. He has helped more than 7000 young farmers through this plan.

Mr. Meredith helped organize a National Committee on Boys' and Girls' Club Work. Prominent business men, including bankers, packers, and manufacturers are associated with him in this work, the object of which is to coördinate the business interests of the country in behalf of the club movement so that the work may have leadership in every county and every boy and girl may benefit through membership in these clubs.

In January 1920 Mr. Meredith was selected by President Wilson to serve in his Cabinet as Secretary of Agriculture. When President Wilson called Mr. Meredith, the *Des Moines Capital* carried the following editorial:

"President Wilson has appointed our fellow townsman, Hon. E. T. Meredith, to the position of Secretary of Agriculture.

"First of all, the people of Des Moines will be most gratified in this appointment. Mr. Meredith's popularity in his own home town is not confined to party lines. He is always helpful and serviceable in his own community.

"He is a self-made man. He is a man of great energy; in fact a tireless worker. He started his career as a publisher with $1500 worth of old type and he has built his business to a state of prosperity. It has been a part of his life study not

only to achieve for himself but to help others. He has been an original thinker. In his line as an agricultural publisher he has been a leader."

Mr. Bruce Bliven in *Associated Advertising* for March, 1920, wrote in that paper concerning the appointment of Mr. Meredith to the Wilson Cabinet:

"E. T. Meredith, president of the Associated Advertising Clubs of the World, has a new job.

"As was told in a brief note in last month's issue of *Associated Advertising*, he has been appointed by President Wilson Secretary of Agriculture.

"There are thousands of members of the Chamber of Commerce of the United States who know him as one of the directors of that organization for four years past. In Chicago banking circles he is known as a director of the Federal Reserve Bank of that district. There is also a group of 800,000 farmers to whom Mr. Meredith is known as the publisher of a farm paper which they like so well that they pay advance subscriptions.

"In England and France there are not a few who remember him as a member of the Labor Commission which visited those countries on an official errand during the war.

"Many American business men learned to know and respect E. T. Meredith as a member of the Excess Profits Advisory Board. Finally, the public as a whole has read of Mr. Meredith's activities as a member of the President's First Industrial Conference.

"For a man to have such a varied record, and with it all to have made himself a millionaire at the age of forty-three from a standing start, implies a remarkable history and a remarkable personality."

It used to be said that the publisher of a farm paper was a man who couldn't make good on a farm, and never had. That was long ago. To-day there are any number of good farm papers of whose publishers it is not true, and *Successful Farming* is one of them. Mr Meredith owns several fine farms in various parts of the country, and one of them is near Des Moines, where he can keep his eye on it. He is a keen admirer of blooded cattle, and on his Des Moines farm he has a fine herd of that wonderful breed, the Jersey.

The *Des Moines Register* upon his appointment to the Cabinet said in part:

"In chronicling an event in which all Iowa, and Des Moines particularly, takes great pride, it is well to note a few outstanding facts of Meredith's career. At forty-three, he is the youngest member of the present Cabinet. He is the youngest man to hold the office of secretary of agriculture. He owns a beautiful home and a farm which he has opened to the public on various occasions as a picnic ground.

"Meredith is known to Iowans, aside from his political career, for the modern methods employed in his publishing plant, and the spirit that is maintained there. It is peculiarly true of Mr. Meredith's success, that the element of chance has played little part — the element of good sense, determination and adherence to ideals, everything. No brilliant streak of luck came to him, no theatrical turn of a card brought him up from the bed-rock of poverty to be a millionaire publisher, or a member of the presidential cabinet.

"A side to Meredith which is best known to his closest personal friends and those who work for him, is his readiness to lend a helping hand.

"His was the idea of lending money to boys and girls with which to buy a pig, a cow, a sheep, or any animal wherewith to make a start.

"His purpose in doing this was to interest the boy or girl in the farm, to increase farm production, and to teach the boy or girl primary business principles.

"He is quoted as saying, 'Keep the farm boy and girl on the farm. To do this you must make the farm interesting to them. You must make its attraction as great as that of the city.'

"As Secretary of Agriculture, it is certain that Meredith's life-long ambition to see this dream realized will be made to come true, if it is in his power to do so.

"The early struggles that Mr. Meredith passed through have always been known to his friends.

"The days when he had to put up the money for postage at the postoffice before his publication could be mailed out, when he had to pay his friends with checks which he was obliged to ask them to 'hold a few days' until the money from advertising came in.

"There has never been any secret about Meredith's hardships in his early days."

Mr. and Mrs. Meredith have two children, a daughter, Mildred, now Mrs. F. O. Bohen, and a son, Edwin, Junior.

Mr. Meredith served his country with distinguished ability as Secretary of Agriculture under President Wilson from January 27, 1920 until March 4, 1921, when his neighbor in Des Moines, Henry C. Wallace, took the position in the Cabinet of President Harding.

HENRY C. WALLACE

HENRY C. WALLACE

1866–1924

Henry C. Wallace was born in Rock Island, Illinois, in 1866, the son of a United Presbyterian minister who served two congregations, one in Rock Island and the other across the Mississippi River in Davenport. This man, Henry Wallace, a Scotch Irishman, was the eldest son of John Wallace, who came to the United States from the north of Ireland in about 1830. As far back as they have any record the Wallaces were farmers, but as is the case with many Scotch Presbyterians, it was usually hoped that at least one son would be a minister.

After a few years in the ministry, fear of tuberculosis made it necessary for Henry Wallace to abandon that field and take to the open air. He had accumulated through his father's estate a considerable amount of wild land in western Iowa, and upon giving up the ministry he devoted himself to improving this land. In this way Henry C. Wallace, the Secretary of Agriculture under President Harding and President Coolidge, got practical farm experience while a boy. He spent most of his summers on the farm and his winters in a small town attending school, and incidentally, learning the printing trade. At the age of nineteen he entered the Iowa State Agricultural College at Ames. A few weeks before the time to return from his junior year a tenant on one of the farms gave up his lease on short notice. To meet

this emergency young Wallace went to the farm instead of back to the college. He had planned to stay only long enough to find another tenant but became so interested in the work that he remained there for five years.

In the fall of 1887 he was married to May Brodhead, a descendant of one of the earlier families of the United States. Two children were born to them while they were living on the farm, Henry and Annabelle. This period, 1887–1892, was not a very prosperous one on the farm. Mr. Wallace burned corn or sold it when he could at ten or fifteen cents a bushel. He sold hogs at $2.75 a hundred. Good land could be bought at this period from $10 to $20 per acre. The land was rich and the yields rather high. Markets were not good, and many farmers had so much land they were called "land poor."

During his life on the farm Mr. Wallace wrote on agricultural subjects for some of the farm papers of the time. These articles attracted the attention of Dean Henry, Director of the Wisconsin Experiment Station. On Dean Henry's earnest advice Wallace returned to the Iowa State Agricultural College in the spring of 1892 and completed the work of the junior and senior years in one year. A few months after his graduation he was appointed Assistant Professor of Agriculture, in charge of dairying.

The head of the agricultural work at Ames at that time was James Wilson, who in 1897 became Secretary of Agriculture, a position he held for sixteen years, the record for continuous service in the cabinet of the United States.

In the spring of 1895 Henry C. Wallace and his younger brother, John P. Wallace, joined in founding an agricultural paper known as *Wallace's Farmer and Dairyman,* the name

of which was later shortened to *Wallace's Farmer*. The two sons suggested to their father that he join forces with them and become the editor-in-chief of their paper. Henry C. was made assistant, and John P. accepted the position of advertising manager.

The father, in addition to being editor, spent about half of his time in Farmers' Institute work throughout the state. This helped to advertise the paper and gave the editor a fine opportunity to learn the agricultural conditions in the state. It also made many friends for the Wallaces. John P. gave his entire time to the advertising end of the business. He rode all over the state on a bicycle soliciting advertisements of live-stock breeders. While the father was out at Institutes and John was hustling for advertising, Henry C. had to take charge of the office. This necessitated his acting as managing editor and business manager. His training as a practical printer was a valuable asset as it enabled the firm to get along without high-priced mechanical help.

The new enterprise prospered from the start. In January 1896 it became evident that the *Journal* would be hampered in its growth at Ames where it had started, so the firm decided to move to Des Moines. The Wallace family came with it.

The paper continued to grow, and it was found necessary to publish it every week instead of every two weeks as had been the custom. The paper very early took an active part in anti-monopoly legislation and has given more attention to agricultural economics than any other agricultural paper in the country.

The three Wallaces continued the publication of their paper until the death of the elder Henry Wallace in February, 1916. At the time of the father's death the paper had become

one of the leading agricultural publications in the United States. Since that time it has been continued by the two sons, with the additional help of three sons of Henry C. The eldest son, Henry A., succeeded his father as editor when the former became Secretary of Agriculture.

The Wallaces have always been inclined to take life seriously, combining with their sense of business a strong feeling of responsibility to the community. The present heads of *Wallace's Farmer*, Henry A. and his brother, John P., upon whom most of the burden of directing the publication fell when Henry C. went to Washington, have always taken an active part in public affairs, despite the demands of their business. During the World War John P. was at the head of all campaigns for raising funds for the Red Cross in Iowa, and Henry A. was the leader of Y. M. C. A. work in the state. He passed personally upon all Iowa men who were sent out for overseas "Y" work.

The family has always taken an important part in work calculated to promote farm interests in Iowa. When the movement to improve Iowa corn was started in 1902, an effort was made to secure Professor P. G. Holden, a leading authority on the subject, as a member of the staff of the agricultural college, and *Wallace's Farmer* joined with two other concerns in contributing towards an attractive salary for him. Both Uncle Henry and Henry C. were on the first special corn train that was ever run in Iowa, as well as on the first good roads train.

The Secretary of Agriculture was for seventeen years secretary of the Corn Belt Meat Producers' Association, the most active guardian of livestock feeders' interests in the Middle West. This Association was instrumental in secur-

ing important reductions in freight rates on live stock from Iowa to Chicago as well as a much needed improvement of service.

Those who know the Wallaces consider their American home life an even greater achievement than their public success. As Marshal Foch "makes war," so Mrs. Wallace "keeps house." Their Thirty-seventh Street home, a substantial but not elaborate mansion of brick, is set in spacious grounds and faces a pleasant natural woods. The rooms are spacious, light and airy, and the domestic artistry is so complete that to mere man nothing is obvious. The charm of the Wallaces' hospitality is proverbial. Within three weeks they entertained two former presidents of the United States. William Howard Taft was a visitor, and eighteen days later Theodore Roosevelt spent some time at the Thirty-seventh Street home. The necessity for a four-year stay in Washington created a dilemma for Mrs. Wallace. She had to maintain two establishments — one for her husband and two daughters, Ruth and Mary, and another for the three boys who remained in Des Moines to help their uncle, John P., run the *Farmer*.

During one phase of the newspaper talk regarding the selection of the cabinet Mr. Wallace's brother, Dan, who publishes a farm paper at St. Paul, was mentioned for the Farm Portfolio. But Harding decided to add the Iowa man to the long list of secretaries of agriculture from Iowa who have handled the post so well.

By another coincidence Mr. Wallace succeeded his neighbor, Edwin T. Meredith, as head of the department of agriculture. Thus he has been thrown in intimate contact with "Tama" Jim Wilson and Edwin T. Meredith, who

preceded him in office, and with Dean Curtis and his brother, who were his rivals for the job.

As time has passed, the younger members of the family have all taken some share in the publication of the paper. In 1910 Henry A. Wallace, eldest son of Henry C., graduated from Ames. He went to Europe for the summer to study farm matters there and since then has been on the editorial staff of the paper. His specialties are farm economics and statistics. He performed the major share of the work of outlining the food administration's policy on live-stock prices and is the author of a textbook, *Agricultural Prices*.

The two other sons of Henry C., John B. and James W., came into the paper after serving in the war. Ross, the only son of John P., is preparing to follow in his father's footsteps in the advertising department. A nephew, Bruce Ashby, son of Harriet Wallace Ashby, will also join the staff. His mother has edited the home department and the poultry department of the paper, and has also written many special articles for magazines, among them the *Outlook*.

Notwithstanding their devotion to the paper, the Wallaces have always owned one or more farms and are still in active touch with farm problems. They have operated farms in Missouri, Nebraska, South Dakota, and Minnesota, one of them eight hundred acres. Henry C. still owns a 280-acre farm eight miles north of Des Moines, and his son, Henry A., owns forty acres adjoining. During the war when there was a shortage of milk for the hospital at Camp Dodge, these two farms were devoted largely to dairying and produced high-class milk for the base hospital.

Mr. Wallace says frankly that it is almost impossible for a man who has an active business in town to operate

farms successfully with hired help. He has always felt it necessary, however, to operate farms of his own in order to keep in that close touch with practical agriculture which is so necessary in the making of a first class agricultural paper.

Mr. Wallace's persistent fight against the packers' unjust tactics in dealing with meat producers created for him a great deal of bitter opposition when his name was mentioned as a Cabinet possibility. His record in agricultural affairs, however, spoke for itself, and President Harding, from a broad field of candidates, selected him for the office. His achievements as an officer of the Cabinet have proved the selection a wise one.

Since the foregoing was written, Mr. Wallace died in Washington, following an operation, on October 25, 1924. Messages of sympathy poured in from all over the country, from the President and from men in all walks of life. In the words of the Chief Executive, Secretary Wallace's "loss will indeed be a grief to the entire nation, for his fine qualities and able, untiring services have endeared him to all the people."

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